The Builder.

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THE late dreadful accident at Yarmouth has led various correspondents to address us; some on the safety in general of bridges erected on the suspension principle, some on the cause of this particular accident, and one on the apparent lightness and instability of the new Hungerford Bridge. We have before us various statements, too, for and against Dredge's principle, and a notice of Andrew Smith's suspension and parabolic tension bridge, which does not require piers.

"A fatality seems to attend chain bridges," says one writer, "even when the most eminent engineers erect them. At Paris, two attempts failed a few years since, through, I fear (good mathematicians as our neighbours are), some omissions in the formula. The Montrose suspension bridge partially gave way at the opening some years ago; and at the time, I was told, several individuals were impaled on the iron-work for hours, before tackle could be brought to bear to relieve them. Since that, both it and the Menai have been injured by storms; and I must say, from what little consideration I have been able to give to the subject, as a mechanic of the humbler class, I do not think suspension bridges are built strong enough or sufficiently braced."

The Broughton suspension bridge at Manchester broke under a body of only sixty soldiers passing over in marching order, — the simultaneous tread of the feet having the effect of a series of heavy blows.

One of Mr. Dredge's bridges in the Regent's Park is understood to have fallen with only a dozen boys on it; and others are said now to be in a state of dilapidation, if not danger. We have no wish, however, to be alarmists, and to raise fears which may not be so easily quieted. Still, feeling that calculations are not to be entirely relied on in these cases; that much depends on the goodness of workmanship which *has not been tested;* and that the mere fact that a suspension bridge has carried heavy loads nineteen times is no reason why it should not break down the twentieth,—we are impelled to urge the necessity of constant examinations by efficient persons. "From the rapid advances which have, of late years, been made in the sciences," says a writer in the *Mining Journal,* "and their application to the arts, we have discovered that iron undergoes most important changes under various circumstances — such as continual percussion, electricity, galvanic action, &c. — and I think it becomes a subject of deep interest, and one which ought to be most searchingly investigated, whether these agents, or any of them, have contributed to produce the effects in question; and the public must be informed whether any, and what, examination of the chains, suspension rods, &c., takes place in these erections, and how often; for, be it remembered that, while a stone structure gives token of decay, and openly exhibits to the eye any danger or necessity of repairs, one corroded bolt in a suspension bridge — one portion of iron, which, though having stood the proof before being used, may, from some of the above-named causes, have become chemically altered — may at once, unnoticed, and without the slightest warning, be the cause of irreparable mischief."

The jury who investigated the late melancholy catastrophe at Yarmouth are much to be commended for the determination they evinced to have the cause of the accident examined into by a scientific engineer. When the town-council refused to furnish them with such assistance they addressed a memorial to the Secretary of State, setting forth: "That in consequence of the excitement which exists in the town and neighbourhood, and of numerous reports in circulation as to the state of the bridge, your memorialists considered it absolutely necessary that they should have the evidence of some scientific practical engineer, in order to enable them to arrive at a just and proper conclusion; but the coroner having no power to pay the expenses which would be incurred by the employment of such engineer, your memorialists addressed a representation of the circumstances to the town-council of the said borough, requesting that body to authorize the employment of an engineer for the purpose before mentioned. That your memorialists have received a formal communication from the town-clerk of the said borough, stating that the town-council, at a meeting held on the 8th inst., had declined to comply with your memorialists' request, feeling that it was not in their province to do so. That your memorialists are still of opinion that the evidence of an engineer in their investigation is imperatively called for; because they not only know that it would be satisfactory to themselves and to the public, but they also believe that the publicity which would be given to his evidence might be the means of preventing the recurrence of so frightful a catastrophe:"—and praying that he would direct some civil engineer to attend on the spot.

Mr. Walker was accordingly sent down, and there can be no doubt that much good will result from the clear and able statement which he made after his survey. This statement involves several questions of great importance, and we deem it desirable to transfer it to our pages nearly entire; the more so, too, as it gives a history of the bridge, and the addition that was made to it.

"The bridge belonged," said Mr. Walker, "to the late Mr. Cory, father of the present owners, and was constructed from a design of Mr. Scoles, an architect in London. At first it was only a substitute for a ferry over the river Bure to the marshes, and to certain pleasure grounds called Vauxhall-gardens, belonging to Mr. Cory. Mr. Scoles, who has attended from London on this occasion, and who has assisted me very liberally with his drawings and calculations, states, that he made designs for a bridge of sufficient width for a carriage and two footways. The design was made from memory of the particulars given to him by Mr. Cory, but I understand that he never was at Yarmouth until the day before the bridge was opened; that these drawings were given to Mr. Green, a surveyor at Yarmouth, who was at that time employed here, and who was well known in this district. Mr. Scoles thinks Mr. Cory had at that time in view the making of a new turnpike-road from Yarmouth to Acle-which-road, which was to pass over the bridge, although Mr. Cory at that time did not so inform him. It appears that the work was offered for competition, and that Mr. Goddard was the contractor (who is since dead) for the bridge work, according to specifications prepared by Mr. Green, the surveyor I before referred to. These specifications were embodied in the contract, which contract I have seen, but which does not give the size of the principal parts, although it refers to drawings which it states are attached to the contract, but which are not, nor have I been able to see them. It appears that they are either mislaid or lost. The specifications describe that the iron shall be of the best quality. The specification describes it as the best charcoal iron. Now, this is a description of which very little is made in this country; the meaning of the term is, that it was to be British iron of the very best quality. The specifications make no mention as to the quality of the iron being tested, as far as I have observed. From a drawing which is now in Mr. Scoles's possession there appears no reason to doubt that the main or suspending chains and other parts of the bridge are of the size which was intended. The drawing which I have in my hand is executed in a very excellent and workmanlike manner. There are altogether four suspending bars, two on each side, to form a chain. The bars are connected together by bolts passing through openings or eyes at each end of them. These bars are 2¼ inches wide by seven-eighths thick; from them rods of 1 inch square were suspended to carry the roadway, which was 14 feet 9 inches in width, and divided by an iron kerb or carriage-way from a footpath on each side 4 feet in width. The length between the centre of the towers is 92 feet; the deflection of the chains is 7 feet 4 inches. An Act of Parliament, constituting the bridge a turnpike-road, was passed in May, 1830, and the road was opened in 1832; in 1842 the Yarmouth and Norwich Railway Act was passed, which contains a clause, obtained, as I understand, after much litigation and opposition, by which this bridge was constituted the only communication between the railway station and the terminus, Mr. Cory agreeing to receive the tolls, stipulating to widen it and afterwards to suspend it. It appears that on this occasion Mr. Scoles was again consulted respecting the widening of the carriage-way to a width sufficient for two carriages to pass abreast—the footway being formed on each side by planks separated by iron straps attached to the framing of the bridge. This footway was therefore outside the suspending chains. That was in 1844. Mr. Cory says, that after the above alterations were made, he consulted an eminent engineer as to the sufficiency of the bridge, who said that it was fit for any traffic. I cannot help observing on this, that any opinion taken from an engineer, however eminent, in an off-hand manner, is what the engineer would not consider himself bound by, and which I should think it very unfair to implicate him in; because sometimes a gentleman is asked a question in an off-hand manner, and either from a feeling of politeness, or a desire to get rid of it altogether, he answers in a favourable manner; much more so than he would if he had an opportunity of examining it. The foundations appear to have been piled well, and to have stood well. Mr. Scoles shewed me a drawing of the piling, and, if the work were executed according to that, I have very little doubt of the soundness of the foundation. You are probably aware that I am very well acquainted with the foundations of this part of the country, having been consulting engineer to the Haven and Pier Commissioners for many years. I have also made drawings for a fixed bridge over the Yare, and I erected the temporary bridge which is now there. It is stated that the crowd collected on the 2nd of May was confined to the south side; that the crowd was composed chiefly of children in the front rank, with adults behind, to see some exhibition which was then to be seen on th water. They were supposed to be four or five deep, and it appears that they had collected on the bridge to the number of from 300 to 500. The coroner has stated to me that he has seen double the number on the bridge (or even more than that), but that on those occasions they were spread over on both sides of the bridge, so that all four bars or two chains were equally loaded. It has been stated, I believe, by one of the witnesses who has been examined before, that some sort of cracking noise was heard, which induced him to look up, when he saw that one of the bars or rods of the suspending-chain was broken—that two points where the fracture had taken place were entirely separated, and that in about five minutes afterwards came the fatal catastrophe. This cracking was no doubt occasioned by the snapping in pieces of the bar which first gave way. There was now only one bar left to support the whole weight, and this bar consequently gave way in five minutes after the one on the opposite side; the platform, being then entirely unsupported, fell in the river. I

have seen and particularly examined the two bars which gave way — they form the link next but one to the saddle or top of the chain on the east or Yarmouth side of the bridge. The fracture in the bar which first gave way is about eight inches from the other end, and there is the same distance from the lower end of the bar. It appears that in forming these bars the two circular ends and about six inches of the straight bar were first made. Between these a straight bar of the proper length was afterwards introduced, each of the pieces having been what is termed scarfed—that is, terminating diagonally, and not in a straight line across. These three pieces being heated and welded together made one bar or link. Then each bar had in it two joints, six inches from one and six inches from the other. In work of this kind there is great difficulty in getting iron so constructed as to make a perfect union or junction with the two ends. It was at these points that both bars in the present case broke. On minutely examining the fracture of the bar, it is evident that for some length of time, or from perhaps its original manufacture, the "weld" was imperfect—not more than one-third of the melting surface being united, and the other two-thirds presented a rusty surface. This would have been doubtless seen, as it is evident on a very slight inspection. The joint or weld of the other link is good—the corresponding one forming the bar. But I find that this bar (the second one) is one inch longer than the one which broke first; in the bar which broke second, putting the bolts through the eye at the lower end, I find that it does not fit, but passes obliquely, and is one inch longer than the other. This extension or difference of length is caused without doubt by the stretching of the unsupported rod before it broke, during the five minutes that it had the whole weight to carry. I have no doubt but that this caused it to stretch quite an inch in length. Having had the quality of the iron tested in a variety of ways, by a very intelligent blacksmith (Mr. Gooda), I find the straight pieces, or middle of the bar, to be much better than the other end; the straight piece is better than the end pieces, which contain the eyes, which are very coarse and inferior in quality. This (holding a bar up to the jury) is one of the middle pieces; not the one which broke, but one taken indiscriminately. I desired Mr. Gooda to lengthen it, and to apply a power to twist it. As far as I can judge this iron is good. I also desired a screw to be formed in another bar, and I am of opinion that that bar is also good. There is another straight piece between the two ends. I think generally that the quality of the ends is not according to the specifications, nor are they in my opinion proper for the purpose. Had any sufficient means been used to prove and test them, the inferiority of this iron must have been at once discovered. This is a piece of one of the ends, which is a very open, coarse-grained, and inferior piece of iron, and which broke when the blacksmith referred to was applying a hammer to the middle of the bar; the part which he did not strike broke like a piece of cast-iron. The blow was applied, remember, at some distance from where it broke. If care had been taken to test this iron properly, it is impossible but what this defect must have been discovered. No one could have expected that it was going to break, but it did. Another bar was taken by my direction for the purpose of testing it as to fibre, and it broke in pieces just in the way a carrot would do, and did not bend like a piece of stout fir timber, which it would have done had it been sound. I shall now make a few remarks upon the strength of the bridge, as compared with the load. Taking the load at the time to be all on the south chain, I find by calculation that the two rods of 2¼ inches by ⅞ are capable of supporting a temporary load of 56 tons without injury. Of course, I am assuming in that, that the bridge should be properly constructed. I need not say, that in order to arrive at any thing like accuracy, a great deal of calculation is required, because the deflection of the iron and the span of the bridge ought to be taken into account. I find that the strain, taking 400 individuals at an average of seven stones each, and allowing for the weight of the bridge, was, at the time of the accident, about 44 tons. Therefore, but for the defect in the quality of the iron and in the workmanship, the strength of the bridge exceeded the load upon it; but even then the excess was not sufficient where the effects of failure are so important. I say so because experiments are generally made with good iron, and at all times large allowances ought to be made for imperfections. If we suppose any of the pieces to be bad, as was the case here, then we have the strength less than the strain. The bridge appears to me to have been by no means too strong as originally formed, and the additions made to its width have been in the present case exceedingly injurious by the weight being placed outside the suspending chain. The weight had therefore to be carried entirely by that chain in place of being equally borne by all, which is the case when the weight is within the chain. In reference to the sufficiency of the bridge to carry the greatest load which could be placed upon it, I find that its strength is somewhere a little above the weight which it would carry, but so small as not to be practically sufficient, even without any allowance for imperfections. It is proper, however, to say, that the question is not, how many people can be packed *en masse* upon the bridge, although even that contingency ought to be provided for. After the bridge was widened the strength exceeded the strain, of course, less than it did before; but, even before, it does not appear to me to have been sufficiently strong to ensure perfect security, supposing a mass of people to have been packed upon it in the way in which I have described. It appears that on other occasions a very great number of persons had been upon the bridge, and that it had borne them without falling; the coroner has informed me that he has known twice or thrice the number upon it that was collected on the occasion alluded to, and therefore we have it evident that for the load at that time the strength of the bridge was adequate. It is also evident that when a bridge has been frequently loaded to the utmost which it will bear, it becomes weaker and weaker each time, and the bridge may ultimately give way, although at first it was sufficiently strong to resist the weight put upon it. I have now only a few remarks to add in the shape of general conclusions from what I have stated, and they are these:—

1. I consider the immediate cause of the accident to have been a defect in the joining or welding of the bar which first gave way.

2. That the quality of the iron and the workmanship, as far as I have been able to examine them, are defective; and I believe that the accident would not have happened had the work been properly examined at the time of construction.

3. That the widening appears to have been made without sufficient reference to the original strength of the bridge, and the weight which it had to support, and therefore that it acted as an aggravation of the evil.

4. That in the original construction of the bridge, the casualty of a great load, all on one side, does not appear to have been contemplated; if it had been, I think that the links on that side would have consisted of more than the two bars, any one of which was unequal to the load which the bridge was likely to carry.

I am bound to add, that in this investigation I have received every possible assistance from Mr. Cory with reference to all documents which were in his possession; this has enabled me to come to the conclusions I have done in less time, and I hope with a greater approximation to accuracy, than otherwise I could have done. I believe I have said all I have to say, as far as the case has gone. I can only add, that under the direction of Sir James Graham any question which any gentleman might put to me I shall be very glad to answer. Perhaps I may also add, that the whole weight of the bridge has been taken with great accuracy by Mr. Scoles, and that the addition to the width, as far as its own weight goes, is comparatively unimportant. The weight of the bridge, including the suspending chains, before the additional width was added, was 17 tons, 14 cwt. 3 qrs. 25 lb.; with the additional width, and the railing added, its weight was 20 tons, 8 cwt. 9 lb., making an addition of 2 tons, 13 cwt. The evil of it is, the footway being outside the chains, and therefore throwing the whole load upon the two suspending chains, without any part being thrown upon the chain on the north side.

In answer to questions put by Mr. Evans, Mr. Walker said—I saw in the original specifications that all the wrought iron should be proved by heating it red-hot; and, if this had been adopted, we should not have had the weldings which we have seen to-day. I observe, in the specifications, that all the materials to be used in the before-mentioned works should be of the best quality, and that it should be in the power of Mr. Cory, or his surveyor, to reject any materials which he or they might deem insufficient for the works. It was most undoubtedly the duty of the person undertaking to be the surveyor of these works to have ascertained by some such means as I have described the quality of the iron, and the manner in which it had been welded. If the surveyor, who is since dead, and whose duty it was to watch and see the contract carried out according to the specifications, had done so, this accident would not have happened, in all probability;—I mean that the defect must of necessity have been discovered. If a person had watched, as he should have done, the welding of every link, this defect would not have arisen: the defect in the quality of the iron must have been very apparent to any one at all acquainted with the subject. I have made my calculations as to the weight of the people upon the bridge upon six to the square yard. I should think that, practically, such crowding seldom, if ever, occurs. It is with reference to such packing that I have spoken, and I think the bridge would hardly have borne it. I think even if, as I believe to have been the case, the crowd consisted chiefly of women and children under fourteen, that seven stones is about a fair average weight. It is too much of course for children, but not enough for a good fat woman. It is perhaps rather a large average. I took it partly because it has been frequently adopted before. Looking at the contract generally, I do not think the gentlemen who built the bridge originally had taken the necessary precautions to have the work properly done, more particularly as regards the mode of doing it. I think the contractor should have given the engineer or inspector of the work the power of having it tested in such a way as he should think fit. I do not find that in the contract. The clause which empowers the engineer to reject any materials which he might deem unfit gave this power indirectly, and in a manner; but I think the surveyor ought to have the power to do so without such a clause as that.

By the Jury.—In my opinion, and speaking from the general result of experience in these matters, the defective iron bars were probably made in the country; they were sent here, and the good iron (the middle pieces) was supplied at Yarmouth and used here. The welding, or joining, was most likely done here. The difference between good and bad iron was shewn mainly by the breaking; good iron broke like a piece of good fir timber; bad, as I have before said, like a carrot—it snaps in two. He had estimated the number on the bridge at 400, because the statements he had heard were 300 and 500. If 300 were the proper number, you have only to deduct one-fourth from the estimated weight on the bridge.

GOVERNMENT GRANTS.— In the Parliamentary estimates, under the head of "Public Works and Buildings," we find the sum of 112,217*l.* appropriated to public buildings and royal palaces, 6,500*l.* to the palm-house at Kew, 8,395*l.* to the temporary houses of Parliament, 85,000*l.* to the new houses of Parliament, 3,836*l.* to Holyhead harbour and roads, 50,000*l.* to the Caledonian Canal, and 24,661*l.* to public buildings in Ireland. Under the head of "Education, Science, and Art," we find a sum of 75,000*l.* applied to public education in Great Britain, 75,000*l.* to public education in Ireland, 4,911*l.* to schools of design, 2,006*l.* to professors at Oxford and Cambridge, 4,540*l.* to the University of London, 7,380*l.* to universities in Scotland, 5,910*l.* to the Royal Dublin Society, 2,100*l.* to the Belfast Academical Institution, 52,040*l.* to the British Museum, 52,020*l.* to the British Museum buildings, 6,217*l.* to British Museum purchases, 1,500*l.* to the National Gallery, 8,850*l.* to the Museum of Economic Geology, 5,839*l.* to scientific works and experiments, 1,500*l.* for the monuments of Sir S. Smith, Lord Exmouth, and Lord De Saumarez.

WESTMINSTER IMPROVEMENTS AND THE WESTMINSTER REVIEW.

In our leading article of March 15th (p. 121 *ante*), we drew attention to the lethargy of the Metropolitan Improvement Commission, and certain defects in the plan sanctioned by them for the improvement of Westminster; and we described some plans emanating from the Metropolitan Improvement *Society*, wherein by a slight deviation from the intended line and the sacrifice of an old workhouse, the abbey was brought into view; the roadway was continued round the south side of the abbey, leaving the cloisters untouched, and terminating with the Victoria Tower of the new Houses of Parliament.

These latter were afterwards submitted to the commissioners; but they declined to re-open the question, considering themselves pledged to the plan now before the House; and unless some effort be made, the new road will be formed so as to shut out the abbey and render its isolation unlikely for many years to come. The same society proposed a road from Buckingham-palace to the new Houses of Parliament, which would dovetail admirably with their proposed Westminster line, and is imperatively required, and by which the Victoria Tower would be visible at the palace gates. If the Westminster plan now adopted be carried out, this important improvement will be entirely prevented.

In a very interesting article on Old and and New London, that appears in the present number of the *Westminster Review* (for June), and to which we may have occasion to refer again on other ground, there are some remarks on the subjects that may be usefully circulated, and we accordingly transfer them to our columns.

"The site of Westminster Abbey was, in the Roman time, an island formed by a branch of the Thames, and a stream from the uplands, called the Ty-bourne. It was a wild place, overrun with thorns, and was hence called Thorney Island; the name it still retains in old writings.*

The ground, in the course of centuries, has been considerably raised, but a large portion of the district, where the old streams flowed, is still below the level of high-water. The first church, or *Minster*, erected here, was called the *West Minster*, from its being situated to the west of London.

Nothing is known with certainty of the history of any buildings in Thorney Island at the period alluded to by the old monk, when he said: 'the suburbs of Thorney offer incense to Apollo.' A church or an abbey was undoubtedly built about the seventh century, and according to Flete, by Sebert, King of the East Saxons, and nephew of Ethelbert; instigated to the work by Mellitus, Bishop of London. The account of its dedication is fabulous, but not more so than that of a thousand other churches; and is curious as characteristic of the times.

'It was to be dedicated to St. Peter, and the preparations were already made for that august ceremony, when, according to the relation of several writers whose fidelity we leave our readers to judge of, the apostle himself appeared on the opposite bank of the Thames, and requested a fisherman to take him over. There he was desired to wait while St. Peter, accompanied with an innumerable host from heaven singing choral hymns, performed the ceremony of dedication to himself; the church, meanwhile, being lighted up by a supernatural radiance. On the return of St. Peter to the astonished fisherman, he quieted the latter's alarm, and announced himself in his proper character, bidding him at the same time go to Mellitus at day-break, to inform him of what had passed, and to state that, in corroboration of his story, the bishop would find marks of the consecration on the walls of the edifice. To satisfy the fisherman, he ordered him to cast his nets into the river, and present one of the fish he should take to Mellitus; he also told him that neither he nor his brethren should want fish so long as they presented a tenth to the church just dedicated, and then suddenly disappeared. The fisherman threw his nets, and, as might have been expected, found a miraculous draught consisting of the finest salmon. When Mellitus, in pursuance of the apostle's mandate, went to examine the church, he found marks of the extinguished tapers, and of the chrism. Mellitus, in consequence, contented himself with the celebration of mass. We may smile now at such a story, but there is no doubt whatever that for ages it obtained general credence. Six centuries after, a dispute took place between the convent and the parson of Rotherhithe, the former claiming a tenth of all the salmon caught in the latter's parish, on the express ground that St. Peter had given it to them; eventually a compromise was agreed to for a twentieth. Still later, or towards the close of the fourteenth century, it appears fishermen were accustomed to bring salmon to be offered on the high altar; the donor on such occasions having the privilege of sitting at the convent table to dinner, and demanding ale and bread from the cellarer.'

The abbey was rebuilt by Edward the Confessor in the eleventh century, a short time prior to the foundation of old St. Paul's. A portion of the Confessor's building still remains in the Pix-office,* and adjoining parts against the east cloister and south transept; but the greater part of the existing abbey was erected by Henry III., about the year 1250.

Henry the Seventh's Chapel was commenced January 1503; but was still unfinished when Henry died in 1509. In his will, in which provision was made for the completion of the chapel, he names the Prior of St. Bartholomew, Smithfield, as 'the master of the works.'

Henry the Seventh's Chapel is the *chef-d'œuvre* of decorative architecture. In its construction, to use the words of Washington Irving, 'stone seems by the cunning labours of the chisel to have been robbed of its weight and density, suspended aloft, as if by magic, and the fretted roof achieved with the wonderful minuteness and airy security of a cobweb.' But we need not comment upon a work of which the exquisite beauty is acknowledged; we seek only to interest the reader in its preservation, and to shew its connection, at the present moment, with the measures now in progress, professedly for the improvement of the metropolis.

The fire of London, which laid eighty-nine churches in ruins,—the fire of Hamburg, which lately destroyed the Church of St. Nicholas, an extensive edifice, nearly as large and as lofty as St. Paul's,—the fire which consumed the two Houses of Parliament, in which Westminster Hall escaped by miracle,—shew the importance of effecting a complete isolation of Westminster Abbey, by detaching it from the old and decayed buildings by which it is in part surrounded; while public convenience, and the architectural embellishment of our streets—both of which require a worthy approach to the tomb of kings, warriors, poets, and statesmen, and the seat of British legislature—point equally to the same object.

What stands in the way? The apathy (apparent at least) of a Committee of Taste sitting as a Metropolitan Improvement Commission; the natural obstructiveness of a chancellor of the exchequer upon all questions of ways and means not belonging to routine, and the cost of purchasing a mass of inferior third-rate houses and miserable tenements.

The houses in Snow-rents stand in the direct course of a straight line drawn between Buckingham Palace and the Victoria Tower of the new Houses of Parliament; a line which, if adopted for a new street, would isolate the abbey by bringing a roadway on the south side.

A plan for such an improvement was submitted to the commissioners a twelvemonth back, and is given in plan 3 of their third report, just published.†

It is dismissed with the following brief remarks:—

'The Society for Metropolitan Improvements submitted a plan, of which copy is appended, involving a total re-arrangement of the district. Her Majesty's commissioners have declined, therefore, to include the plan of the society in their inquiries.'

The reason assigned appears singularly inconclusive, for 'the total re-arrangement of such a district as lower Westminster' was almost, in the very terms of the commission, one of the objects for which it was appointed. The line proposed would have been a short one, entering the park near the Broadway, and thence proceeding to the palace through an avenue* of trees. From the palace gates the Victoria Tower, 300 feet high, would have been visible as the termination of a grand vista, corresponding with that of the Champs Elysées and the Triumphal Arch of Napoleon, but superior in effect; and the cost of a line, thus forming a fitting connecting link between the residence of the monarch and the seat of popular representation, would not have been attended with a very serious expense. The cost, we believe, would have been less than that occasioned to the French by the removal of the column of Luxor, now standing in the Place de la Concorde; which was 100,000*l.*

Another line was at the same time proposed with the same eastern terminus, consisting of a modification of Mr. Wason's new street leading to Belgrave and Eaton squares; and the commissioners took a right view of the subject when they decided, that a thoroughfare in that direction was of more immediate importance to the public than an improvement upon the communication with Buckingham Palace already existing by way of Great George-street. They would have been fully justified in deferring the latter project: they were wrong in abandoning it; and they have put themselves still more in the wrong by adopting such a deviation from the plan as, if carried into effect, will render the complete isolation of Westminster Abbey for ever impracticable.

Mr. Wason's line is the proposed street to which we have before alluded; sanctioned by a committee of the House of Commons in 1832. As modified, it will be a street 80 feet wide, with a natural and excellent terminus at the upper end of the Vauxhall Bridge-road, leading to the new and fashionable suburbs of the south-west. So far all is well; but at the other end of the line, approaching Westminster Abbey, what have the commissioners done? To avoid the additional outlay required to purchase an old and dilapidated workhouse, held upon a lease which has but sixteen years to run, the commissioners have made the line crooked at its eastern extremity, cutting off the direct approach to the new Houses of Parliament, and building out of sight, to all persons passing down the line, both the Victoria Tower and Westminster Abbey.

Let us hear no more of taste in England. Love of art, reverence for its noblest monuments, respect for the dead, pride in the past, progress in the present, are sacrificed to a pseudo-utilitarianism; not that which Bentham loved, but scorned;—a rotten workhouse is weighed in the scale against the most sacred objects of British nationality, and the latter, in the estimation of a Metropolitan Improvement Commission, kick the beam!

When the intentions of the board became known the commissioners were urged by the Metropolitan Improvement *Society* to reconsider the plan in reference to the eastern terminus, with a view that nothing might be done to impede further and greater improvements in the vicinity of the abbey; however long they might be delayed. The application was unsuccessful. The society then forwarded to the commissioners a new plan, accompanied with a sketch shewing the abbey as it would appear on the south side, with the cloisters, chapter-house, and other parts of the old cathedral restored, if the abbey were isolated as proposed, by a roadway carried entirely round the edifice; but the commissioners again declined to re-open the question, on the ground that a definite engagement had been entered into with the promoters of the bill now before the house, which could not be honourably broken. The society might have replied, that the practical part of this question is not one of keeping or breaking engagement, but simply of money. We will answer for Mr. Wason and his friends that they, at least, will be willing to re-open the question, if the Government will re-open its exchequer.

The abbey is now chiefly seen from the north; a view of the southern elevation would

* The whole of the abbey and palace precinct, south of Pall Mall, was called by the Normans, "Thorney Island and tout le champ." From the latter phrase Mr. Bardwell derives the word Tot-hill. As there is no hill near the Abbey *Tot-hill* Street would be a misnomer, but it is certainly not at all improbable that the French phrase of *tout le champ* was first clipped into *tout le* and then corrupted into *toutle* and *Tot-hill*. In like manner the favourite Norman sign of Boulogne Mouth became the Bull and Mouth; *L'aiguille et fils* was corrupted into the Eagle and Child; and the more classical sign of the Satyr and Bacchanals was ultimately changed into the Devil and Bag of Nails.

* The *pix* was the box for the consecrated host.

† Hansard, price 5*s.*

* This is not properly shewn by the plan published in the report, which, as coloured, makes the road appear as an encroachment upon the park.

be a novelty to the oldest inhabitant of the metropolis."

A copy of the drawing referred to is given in the review, and the following extract from the explanatory statement by which it was accompanied.

"3. The society, therefore, propose that the line should be so far modified, that its present eastern terminus should be in front of the western towers, and that thence the line should be prolonged on the *south side* of the abbey, through great and little Dean's-yard, leading directly to the new Houses of Parliament.

4. While suggesting this line of roadway, the society desire that it should interfere in the smallest possible degree with the legitimate connection between the abbey, the college, and the ecclesiastical buildings and residences attached. With this view they propose to accommodate as great a number of residents in immediate connection with the abbey as practicable, and to construct connecting archways across the roadway, forming covered communications between the abbey, the college, and the residences. At the same time, by the extension and restoration of the cloisters for the convenience of the residences, the most beautiful perspectives and effects of light and shade would be opened to the roadway. A picturesque foreground is obtained to the general elevation, as seen from the south; and it is from the south that all buildings should be viewed, from the superior effects produced by the direct rays of the sun.

6. The magnificent architectural combination of the cathedral buildings with the Victoria Tower of the new Houses of Parliament, which might thus be realized, would cost a very inconsiderable sum, as the buildings required to be removed are of very inconsiderable value, exclusive of that part of Abingdon-street which, it is understood, the Government have already determined to pull down without any reference to the present plan. The improved value of the ground available for building, should the plan be adopted, would, it is thought, be nearly equivalent for the purchase-money required in the first outlay.

7. The property belongs chiefly to the dean and chapter, and the proposed plan would allow of far more eligible sites than at present for the buildings required, either as connected with the abbey or the school.

The society, taking into consideration that we owe to the church the noblest architectural monuments in the world, cannot doubt the co-operation of the dean and chapter, and of the highest ecclesiastical authorities, if the object be favourably recommended to their attention by her Majesty's commissioners.'

It is certainly within the bounds of possibility that another prior of St. Bartholomew may arise in Dean's-yard; but at present, the dean and chapter of Westminster have the reputation of being hostile to all improvement connected with the abbey, or the district in which they reside. We believe this supposed hostility is merely indifference. The wretched state of their property arises from the system of forty-years' leases, which is about to be changed. They have submitted no plans of improvement to the commission, and contemplate none, only, as they say, because they are not projectors of schemes they could not carry into effect. Sleeping men carry nothing into effect; and it is natural to deans and prebendaries to think more anxiously of preserving a secluded corner for quiet dreams that of Henry the Seventh or of Edward the Confessor. But what have we to do with a dean and chapter! They are but the trustees, not the owners, of Westminster Abbey; it is not for them to decide for the public what approaches shall or shall not be made either to the abbey or the imperial senate house. Let the nation look to its own.

An act of Vandalism is about to be perpetrated. It may yet be stopped. Without interfering with the progress of the private Bill Mr. Wason and his friends have introduced, powers may be taken by the Crown to reserve the question of the eastern terminus of the proposed street, or to repurchase, before new houses are built, the ground required to isolate the abbey, and complete in a satisfactory manner the approaches to the new Houses of Parliament.

We appeal to the Metropolitan Improvement Commissioners to revise their judgment, although at the eleventh hour. Among them are men for whom we entertain the highest personal respect, but we would not see them shut their eyes (nor should the best friend they have) to the true nature of their position. They have undertaken the discharge of a great public duty; and they owe it to themselves—they owe it to their countrymen—they owe it to posterity, which, if we mistake not, will criticize their proceedings with more severity than the present age,—that the mischief now in progress should be remedied, ere it be too late."

THE DISTRICT SURVEYORS.

Sir,—In the *Times* of May 22nd, there are the following remarks:—

"The best friend to the lawyers is a crotchety law reformer, who is permitted by the courtesy of Parliament to turn his conceits into statutes; but such a legislator is any thing but a blessing to his country. If, in addition to an irresistible inclination to alter, he happens to try his hand on subjects with which he is but imperfectly acquainted, the risk that the country, minus the lawyers, will run of regarding him with any thing but gratitude will be so much the greater."

Are not these observations, Mr. Editor, very applicable to the new Building Act? Again in the *Times* of May 24th:—

"The Hong Kong papers have been received, but they contain little more than a number of ordinances exhibiting extreme fertility of invention in the art of raising taxes" (*alias fees*). "Such legislation, as was to be expected, had produced considerable discontent, especially as it was feared, if commerce were shackled with so many burdensome regulations as were either in actual operation or proposed, merchants would resort to some port with a less active legislation."

Would not a *less active legislation* in building affairs be equally desirable?

The case of arbitrary and dictatorial supervision under which the profession labours by the working of the Metropolitan Buildings Act (as set forth by your correspondent "Mr. Thomas Little," in your paper of the 17th May) must come home to every professional man.

However, by the report in your paper of last week, 24th instant, of the decision of the official referees in the Lewisham case, there is a gleam of hope that the building world will not be so much annoyed and *badgered* as the inclination of some officials would cause them to be.

It is to be hoped that the frequent complaints of the system will have the effect of causing amendment, as dripping water operates, "*non vi, sed sæpe cadendo.*"

I am, Sir, &c.,

Philoclarus.

Sir,—Some observations having been made through your journal against the new Buildings Act and the surveyors appointed to carry it into effect, allow me to state that, in my humble opinion (if honestly carried out), it is a great improvement on the old, and you will find the majority of the surveyors appointed under it are men of sound judgment; and I do hope before the public condemn the whole, they will observe in the several districts how their surveyors act, and report accordingly to the several magistrates in the respective counties, in order that efficient men may fill such offices; for it is a more serious matter than has been heretofore considered for the general good of the working class and the public.

I can assure you, with truth, that many buildings have been abandoned in the parish of Bermondsey, owing to the surveyor having been very litigious; and (if I am informed correctly), in six cases out of ten which have been forwarded to the registrar, he has failed. Now, if this be a fact, it is quite time one of our members for this county should move in the House of Commons for a return of the number of cases sent before the registrars under the new Metropolitan Buildings Act, and their results.

I think that would in a great measure make known who are the inefficient persons, and who are competent to fill the office of district surveyor.

Allow me to trespass further on your time, in giving you a statement of facts as to a circumstance which has occurred to me within these last few weeks. My child having received a present last summer of a pair of pigeons, I had a house, or cage, made for them at the back of my dwelling, but finding I had not made it sufficiently high for the child to view the birds from the window of the sitting-room, I had it raised four feet higher, merely elevating the same covering and enclosing it with lattice-work. This was done either the last of December or beginning of January; be that as it may, I have received notice after notice from the district surveyor to pull it down; and at last a meeting of the referees, who, after some conversation on the subject, viewed; but I have not yet heard the result: when I do, I shall feel great pleasure in forwarding the same to your journal for the benefit of the public. I send you a copy of the several notices received, as also the questions to the referees.

Can you inform me if or not I can proceed for the expenses I have been put to in opinions on the Act, caused to be taken through the receipt of the several notices,—not wishing to act on my own opinion, which is, that the district surveyor has no jurisdiction over it, and which I find to be the opinion of most surveyors? Leaving you to make what use you please of these,

I am, Sir, &c.,

W. S. Hollands.

Bermondsey-square, May 24th.

*** As this matter is now before the referees it would be unwise to discuss it. When the award is taken up we will give attention to it.

The new number of the Westminster Review (for June), has the following note:—

"An occupier of premises in the city wished to introduce in his house some of the zinc ventilators recommended by Dr. Arnott (price 2s.), but was informed that before any cutting in an external or party wall (without which they could not be inserted), notice must be given to the district surveyor, pursuant to section 13; and a fee paid. On consulting the list of fees in schedule L, it appeared that the fee would be 1*l.* 15s. the house being a first-rate, and possibly 3*l.* 3s. if the cutting were made in a chimney breast. The official referees had, however, the power to reduce the fee if they thought proper, and an application to them would only cost a guinea for the hearing. The ventilators are, of course, deferred for the present; and as the act makes no mention of any apertures for ventilation beyond a window and a chimney, it is to be hoped the official referees will publish some instructions on the subject, without waiting till an object of such importance is brought before them on appeal. All decisions, however, of the official referees should be advertised and sold, with the act, or they will be useless to the public, as district surveyors do not hold themselves bound to supply information gratis. The act does not enjoin them to give any assistance to a builder in the form of explanation or advice, but, on the contrary, it places them in the position of public informers, profiting by every error committed; one fee being chargeable if the act be duly observed, treble fees in every case of neglect."

We may again mention that all awards made by the referees are open to the public on payment of 6d. for each *class* of awards consulted. We have taken some pains to communicate to the public all the most important decisions pronounced by the official referees, and shall continue to do so, with even greater minuteness, as we are satisfied we may thus prevent much litigation and ill-feeling.

The district surveyors meet periodically, for the discussion of the various questions which arise from the act: if they would enable us to place the result of their deliberations before the public also, difficulties would sooner cease, and much advantage be gained.

Reduction in the Price of Gas.—Mr. Hedley stated a few days since before the committee of the House of Commons on the Caledonian Railway, that in consequence of improvements effected by him in the manufacture of gas, so great a saving in price to the consumer had been effected, that in Liverpool alone it amounted per annum to 20,000*l.* He further stated, that all over Scotland the gas was better in quality than in England, owing to the superiority of gas-coal in the north.

ATTACHED OFFICES TO BUILDINGS COMMENCED BEFORE LAST JANUARY.

One of the latest awards made by the official referees is still further confirmatory of the view we have taken of attached offices and projections, not yet formed, to buildings commenced before January last. After what has appeared in our pages, it ought not to be necessary to publish this award, but as it affects a large number of persons, and some of the surveyors are not convinced without difficulty, it may not be useless to insert it.

Mr. James Bonnin had commenced, and in some instances covered, in before January last, a number of houses in Thurloe-square, in the district of South Kensington. He was in course of completing them by the construction of certain offices attached, and party fence walls, when the district surveyor claimed the superintendence of these offices and walls, on the ground that the footings had been laid since the 1st of January, that they were outside the houses, formed a distinct addition, and were therefore subject to the regulations of the Act.

The builder appealed to the official referees and urged that the offices and walls were a component part of the houses as commenced, and had been delayed merely for the convenience of scaffolding for the higher parts.

The referees awarded (May 24th), that inasmuch as the buildings in question formed, together with the main buildings to which they are or are to be attached, one general design, as shewn by the plan, and that such main buildings were commenced before the 1st day of January, 1845, the said buildings in question, that is to say the aforesaid attached offices and party fence walls to the three unfinished houses in Thurloe-square, are not subject to the operation of the said Act, as to the original building thereof.

And with regard to the costs, they further awarded, that, "inasmuch as the case was one of reasonable doubt," the same (4*l.* 2s. 6d.) should be paid by the builder and surveyor jointly.

ENGLISH ARCHITECTS AT HAMBURG.

The committee for rebuilding the church of St. Nicholas at Hamburg (destroyed by the great fire) having some months back offered premiums for the best designs for that building, which they wish to make one of the finest modern churches in Europe, have lately, out of forty-four designs submitted to their consideration, selected that of Mr. George Gilbert Scott and William Bonython Moffatt, of London, as deserving of the first, and those of Professor Strack, of Berlin, and Mr. Ludwig Lange, of Munich, as those meriting the second and third premiums. In coming to this decision, they were aided by the advice of Mr. Boisserte, of Munich, and of Mr. Zwirna, the architect to Cologne Cathedral. A design by Mr. Atkinson, late of Manchester, is said to have been much liked.

The selected design is in the style of the fourteenth century (the decorated); and may be regarded as one of the most successful efforts of modern architects. The tower is in the centre of the west end, and is surmounted by a lantern and lofty spire of open-work paneling, the whole very elaborately adorned. A peculiar effect is given to the upper part of the tower by a parapet around the base of the spire which projects considerably before the face of the building. The aisles outside present a series of gables, with buttresses and crocketed pinnacles at the points of junction. The commencement of the chancel is shewn by a stone lantern, rising from the ridge of the roof, and a small turret with pinnacle against the clerestory wall on each side. We hope the architects may see their very beautiful design satisfactorily carried out.

Absurdity. — A country correspondent tells us that a gentleman in the neighbourhood of Dudley has recently offered to give the sum of 5,000*l.* for the purpose of erecting a new church, provided that penny postage stamps to the amount of 2,000*l.*, which have been obliterated by passing through the post-office, are sent to him within a limited period. We said "how great!" on commencing the paragraph, but ended it with "how small!"

INSTITUTION OF CIVIL ENGINEERS.

At a meeting held on the 20th inst., the president in the chair, Mr. P. Barlow presented, as an appendix to his paper on the atmospheric system, the result of a series of experiments upon the force employed in drawing carriages up an incline plane of 1 in 43, by a stationary engine and rope traction, upon the Canterbury and Whitstable Railway. From these experiments it appeared, that the stationary engine of 25-horse power, with a rope, would produce a useful mechanical effect equal to the engine of 100-horse power on the Dalkey Atmospheric Railway; thus proving, by direct facts, the deduction of Mr. Stephenson as to the amount of lost power by the latter system. These statements were ordered to be printed with Mr. Barlow's paper.

A paper by Mr. Thorold, M. Inst. C. E., gave an account of the late failure of the Suspension Bridge at Yarmouth. After giving the dimensions of the structure, which appear to have been altered from the original design without the consent or superintendence of the architect, the immediate cause of the failure of the bridge was attributed to the fracture of one of the main links near the point of attachment to the pyramid: on examination it appeared that the iron was originally of indifferent quality, and that the weld had been made so imperfectly that only one-twentieth part of the sectional area of the bar had been welded: it was therefore evident that these links could never have been properly tested. An interesting discussion ensued, in which the principles of the construction of suspension bridges were laid down; and it was insisted upon, from the experience of the Menai, and Montrose, and other large bridges, that the platform of such bridges should be rendered perfectly rigid, so as to prevent any undulation, and that the chains should be merely used to support the actual weight of the platform and the road. The novel and ingenious plan for the bridge over the Menai straits, proposed by Mr. Stephenson, (?) to be constructed of a large wrought-iron tube, supported by chains, was also mentioned, and the principle appeared to be considered sound.

The next paper was by Mr. Grantham: it gave an interesting account of the wreck of the "Vanguard," iron steam vessel, which went on shore on a ledge of rocks, at the entrance of the Cove of Cork, and after remaining there until the rocks were cut away at low water, so that a high-water tide carried her off, was found to be so little injured that a few days sufficed to repair all damages. The engines were scarcely strained, and nothing was broken. This led to mention of some very remarkable instances of the power of resistance of iron vessels, and to the experiments now in progress of trial at Woolwich, on the powers of iron vessels to resist shot. It appeared that with a light charge of powder a hole was merely punched through the plate by the ball, but that with a heavy charge the ball striking the plate with great velocity rendered it brittle, and the fragments fled about in an extraordinary manner.

On the 27th instant, the paper read was by the president, giving "An account of the ancient Harbour of Ostia." From the concurrent testimonies of the classical writers, Ostia was originally founded anno 634 B.C. by Ancus Martius: it was situated at the mouth of the Tiber, about fourteen miles below Rome, and as the supplies for the capital arrived by the river, it was of importance to improve the navigation, and, at the same time, to provide for the shelter of the fleet which usually lay in the roadstead. Accordingly the Emperor Claudius determined to construct a new harbour entirely independent of the river, but at the same time having a connection with it. The general plan of this work, as described by Suetonius, and as given in Cannia's great work on the architecture of the ancients, is shewn to have consisted of an extensive outer harbour, formed by two artificial moles, each projecting about 1,900 feet into the sea, enclosing a space of about 130 acres. Between the extremities of the moles was situated another detached mole, which formed a breakwater, supported a lighthouse, and gave two entrances to the harbour, across which chains could be drawn, to form a closed port in time of war. A small inner harbour was also constructed, in which vessels could always remain afloat. This covered about 7 acres, and communicated with the Tiber by means of two parallel canals, furnished with stop gates, in order that the water of the river might be turned through the harbour, for scouring away the mud, or for other purposes. There is no evidence to shew that the pound lock was known or used. The walls of the moles were constructed upon arches, so as to give free access to the current, but at the same time they were sufficiently solid to break the sea, and to produce tranquillity within. This was very necessary, for, from the geological condition and the geographical position of Ostia, the coast was subject to constant advance from the alluvial deposit brought down by the Tiber: by this means a delta has constantly been in progress of formation, and in the course of 2,480 years the line of shore has advanced about 3 miles 600 yards. All the attempts to improve the entrance of the Tiber were, by this deposit, rendered completely abortive, as the projecting walls only increased the deposit. Eventually the ports of Claudius and of Trajan suffered the same fate, and although the works at Ostia were considered by the Romans as their greatest labour, they were of necessity abandoned, and the harbour of Centum Cellæ, or Civita Vecchia, was constructed as a substitute.

In the work of Ostia there was visibly much novelty and ingenuity in design and in construction; indeed, it must be observed, that almost every principle adopted by the improved skill and science of modern times, appears to have been there carried into effect with singular perseverance and ability. By a careful study of the original plans of these ancient works and the results, engineers might read very useful lessons for the treatment of many of the harbours of England, particularly those on the south-eastern coast, where, as at Dover, great difficulties are to be contended with from the motion of shingle and silt. The position of English harbours differs in some degree from that of Ostia, on account of the former being subject to the action of a great rise of tide and strong littoral currents; while the latter was situated in the Mediterranean, where there is scarcely any tide, and of which the shore currents are sluggish. The deposits of silt would be in the latter case very rapid, as the water of the Tiber entering nearly at right angles with the shore, would arrest the current, and the whole speedily would become comparatively stagnant.

In the discussion which ensued upon this paper, the cases of Dover, Rye, Ramsgate, and many other harbours were explained, and the probable result of the present works commented upon.

INSUFFICIENT SCAFFOLDING.

The daily papers speak of a fearful accident which happened last week at a house opposite Bow Church, where five men were employed upon a scaffold in front of the building. Whilst thus engaged, one of the putlogs, intended to sustain the planks upon which the workmen stood, gave way from the wall, and the cross pieces, being thus left unsupported, broke down, and precipitated all five men, four of whom fell with great violence to the ground, while one clung to a scaffold pole. One of the poor fellows had his leg dreadfully smashed, so that it is feared amputation will be necessary. The other workmen, happily, have not sustained any very serious injury.

Hardly a week passes without the occurrence of an accident through want of care in the preparation of scaffolding, or the use of improper materials: it is really incumbent on masters to see that their workmen are provided with sound and proper boards and poles for the purpose, and are enjoined to avoid unnecessary danger. All who are in the habit of ascending many scaffolds must occasionally shudder at the imminent peril to which workmen are sometimes exposed in this respect.

Improvements at Gainsbro'.—It is proposed to benefit the town of Gainsbro' by converting certain premises situate in the market-place, and recently in the occupation of Mr. F. Otter, into public rooms, corn market, covered butter market, &c., for which they are said to be in every respect peculiarly eligible.

GOTHIC ORNAMENTS FROM THE CATHEDRAL CHURCH OF YORK.

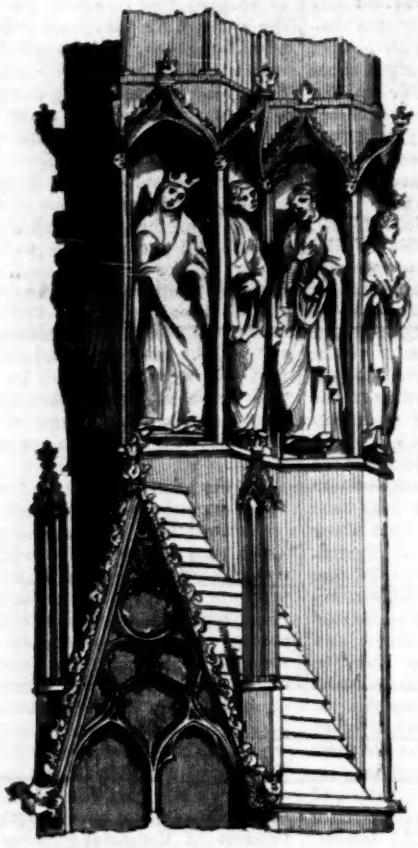


Fig. 14.

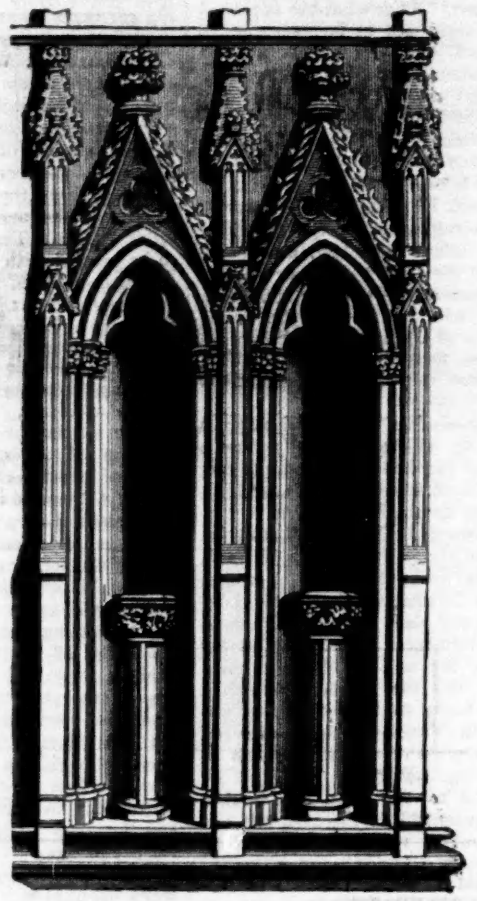


Fig. 15.

GOTHIC ORNAMENTS,
FROM THE CATHEDRAL CHURCH OF YORK.

As we are informed that the details already given have been found useful by a certain number of our subscribers, it has been deemed advisable to extend the series.

The annexed examples are both from the outside of the church, at the west end.

Fig. 14 represents a group of seven statues on a buttress. The figures are 6 feet high, and 76 feet 6 inches from the ground. There is one of these groups on each side of the west window.

Figure 15 represents two niches. The height, from the ground to the moulding at the top, is 17 feet, and the width from the centres of the pilasters 3 feet 6 inches, they are 48 in number.

THE (LAUREL-CROWNED) ARTISANS OF THE PAINTED WINDOW OF THE CATHEDRAL OF CHARTRES.

By J. L——y.

It is with considerable pleasure that the readers of "The Builder" will have perused those well-selected extracts and illustrations, by our talented friend Mr. T. Wright, which appeared in the last number of this periodical. Certainly, architecture (*building*) is the very exponent and criterion of human civilization. But it is to be excused, as it lays, at the same time, beyond the *limits* which Mr. W. has assigned to his researches—that he eschews to broach matters *esoteric*, or such as are connected with the *royal* craft of *masonry*, or modern social science.

The building of the magnificent cathedral of Chartres is coeval with those of Strasburg, Cologne, Vienna; and we know full well that at the latter cities (at least) existed those mediæval *secret associations* of masonry which may well be traced back, and are certainly analogous, to those which existed at the time of the building of the temple of Solomon. Under such circumstances, nothing extraneous to, and incompatible with, the customs and habits of our present artisans can astonish us, or be difficult of explanation. If the *whole* of those painted windows of Chartres were to lay before us, we should certainly recognize some of the well known *symbols* of that ancient association, to which the problematic laurel-crowns might be referred. Besides, those good and democratic olden times were equally famous for the many national festivals (and sports) in which the artisan had his adequate share. The laurel crowns, therefore, may also be marks of honourable distinction, which their bearer might have obtained on such occasions— nay, perhaps, the very mark of their proficiency or *mastership* in their own art.

What Mr. Wright has also not taken notice of is, the tidy, regulated, cleanly appearance which the garments of these artisans exhibit—a striking antithesis of that shreddy, disorderly, and slovenly attire our present working men exhibit in their hour of *work*. But "the work a man performs ought to be *holy* to him"—and such it was with our happy and blessed forefathers. Goëthe (the shrewd—*German* Goëthe) expatiates in one of his works on mediæval *physiognomies*—those also of the humbler classes. "Look at them"—says he—"as they stand before us in their works of statuary and painting!—they are serene, elevated, tranquil, composed." Would this were also the characteristic of our present age of civilization!

The data which Mr. Wright has brought forth, about the wearing of gloves by the *workers* of those times, are rather novel—still, at the same time, a libel on us *moderns*. The workers of the middle ages wore gloves to *protect* their hands from the inroads and injuries of work; their hands, therefore, were probably like their faces—those of human beings. The workers of the present age wear no gloves *during* work—reality is nothing with them; they thrust their hands in kid gloves on a *Sunday*—to hide that abnormity, or ugliness, which our forefathers chose rather to *prevent*. "The times are *worse* than we usually are inclined to think"—says a friend of the working classes, *Lamartine*.

BATHS AND WASH-HOUSES FOR THE LABOURING CLASSES.

A public meeting to promote this object was held at Willis's rooms on the 22nd inst., when the Duke of Cambridge took the chair, and made an urgent appeal for further subscriptions. The selected plans are now being adapted to the site purchased, near Whitechapel, and will provide more than 100 baths, and nearly 200 wash-tubs.

It is proposed that there shall be two classes of baths—the cheaper at 1d. for a cold bath, and 2d. for a warm bath; the dearer at 3d. for a cold bath, and 6d. for a warm bath. The charge for the use of the wash-tubs, and drying and ironing rooms, is proposed to be 1d. for the first four hours, with an increase for a longer time. The committee have reason to believe that with these charges the establishment will become self-supporting in the course of the second year after its opening, and in subsequent years will afford a surplus, applicable to the support of smaller establishments.

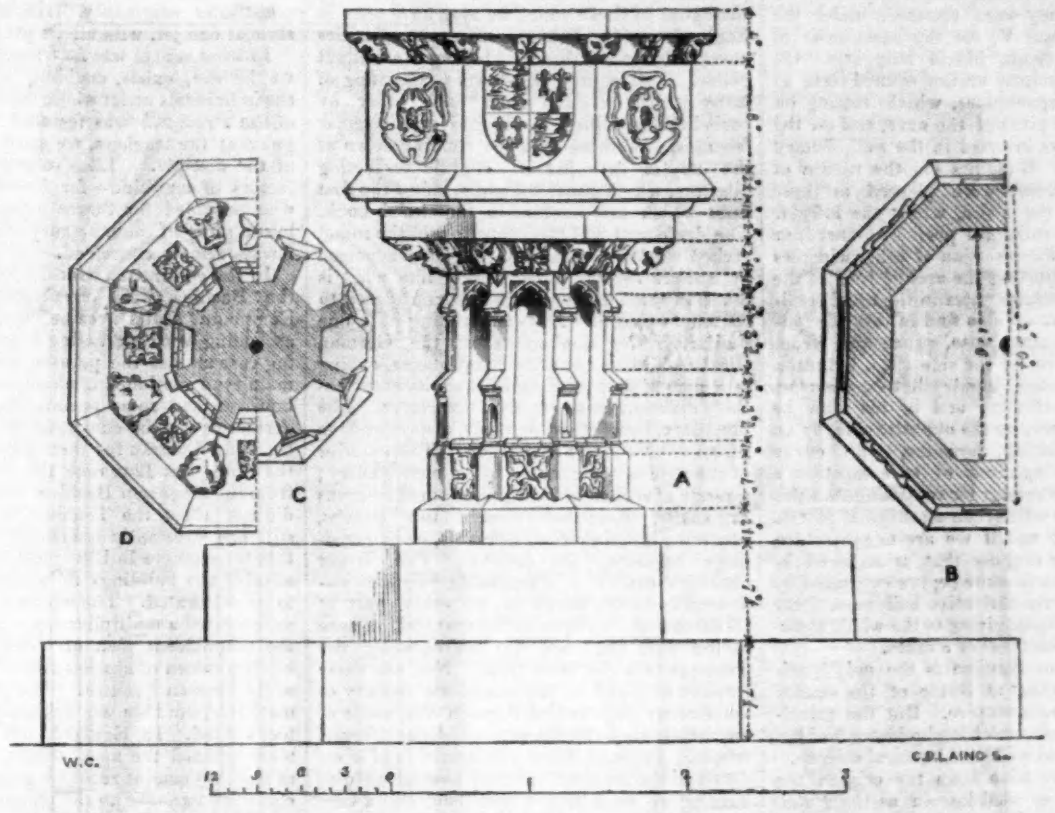
For the purchase of the land and the erection and fitting up of the premises about 15,000*l.* will be required.

The subscriptions already announced amount to 7,353*l.* 8s. 3d., and the committee call on the public to aid them in raising the remainder.

Lord John Manners remarked at the meeting alluded to, that he felt the greatest interest in the success of their undertaking, and he did trust that it would be carried out to completion, unless, indeed, it was intended that we, with all our boasted civilization, should still remain in the commonest matters of life, far behind ancient Rome and Greece, where ample provision was made for the necessities of the people in this respect, and whose magnificent baths remained, even yet, proofs of the interest which they took in the social condition of the people, and monuments of the height to which the building art had at that period arrived. The model of part of the proposed establishment, of which we spoke some time ago, was submitted to Prince Albert last week, and may probably be seen by subscribers on application at the office, in Crosby-square.

NEW YORK PUBLIC LIBRARY BUILDER

FONT FROM ST. JOHN'S CHURCH, MARGATE.



FONT FROM ST. JOHN'S CHURCH, MARGATE.

The church of St. John, Margate, is a very large structure, but is particularly devoid of architectural beauty: it contains little worthy of notice, except the subject of the present illustration, the font; which is a good specimen of late Perpendicular. It is an octagon on plan, with shields and roses on alternate sides: the only shield which remains intelligible, is that shewn in the engraving, having the arms of England quartered with those of France. Hasted, in his "History of Kent," states that other shields bore the arms of the Cinque Ports. The top of the font appears unfinished, or as if it had been deprived of some mouldings.

A, shews the elevation. B, half-plan across the bowl. C, half-plan of pedestal. D, the same, looking upwards. W. Caveler.

SIR JOHN RENNIE'S CONVERSAZIONE.

The new president of the Institution of Civil Engineers gave his first *soirée* to the members of that body on the 24th instant, at his residence in Whitehall-place, and invited a distinguished party to meet them, including a number of ladies.

To increase the accommodation, a temporary building was "waved up" at the back of the house, and formed the chief saloon, with a gallery below for models. The walls and ceiling of the former were decorated in the Italian fashion with painting, by Mr. Sang,—*encore* Mr. Sang,—who we have no doubt feels as much surprised himself at being put over the heads of English artists as we *know* his countrymen abroad are at the favour with which he has been visited. Why, in the world, we should go to Germany for decorations such as these, pretty as they may be, it puzzles one to discover. There *are* decorators in Bavaria who can do fine things, and might advance us if they were to work here for a time; but as to the painter in question—lud! what foolish people we Englishers are!

This, however, is not to disparage Sir John Rennie's elegant room and profuse hospitality. Drawings, bronzes, models of bridges, steam-engines, and atmospheric roads filled every table, and the house was crowded with the men who had designed them, and others who could appreciate.

Amongst the models we may mention, Mittchell's screw-pile battery; the Air Point Lighthouse, by Messrs. Walker and Burgess; Captain Boswall's plan for harbours built with arched piers; the original design, by Mr. Stephenson, for an iron bridge of two arches, each of 360 feet span, to carry the Chester and Holyhead Railway across the Menai Straits, but which is now to be superseded by the suspended tunnel-bridge, formed of wrought-iron; the Folkstone Viaduct, by Mr. W. Cubitt; a cast-iron trussed girder bridge, by Mr. Borthwick; and a model of a stone bridge, with flat elliptical arches, designed some years since by Mr. Rennie, to replace Westminster-bridge. There was a fine model of the "Great Britain," and several of vessels to be propelled by the screw, designed by Mr. Guppy; a steam-frigate, with direct-acting engines and screw-propeller, by Mr. Rennie; a beautiful pair of marine engines, by the late Mr. Henry Maudslay; Mr. Bodmer's proposed horizontal engines and screw-propeller; Mr. Hick's improved locomotive engine; and Messrs. Grissell and James's combinations of a weighing machine and crane, to ascertain the weight of an object while raising it.

ECCLESIASTICAL ARCHITECTURE.*

"In the preceding portion of this article, we have described *six* existing types of the *Augustan Basilica:* a *seventh* remains, destined to exercise, even more than the Roman fabrics, a permanent influence upon Christian architecture. In the Augustan Basilica, the horizontal principle (to adopt the term sanctioned by Whewell and Willis) predominated. Such a Basilica is a building consisting of *single columns or bearing shafts*, supporting either a continuous entablature, or a continuous range of arches, covered by an open roof connected by transverse beams. The *Basilica of the Lower Empire* consists of *compound piers, to which columns are annexed*, but more for ornament than use, and supporting the vaults and arches by which the edifice is roofed. This type completed what the others began. The Basilica of the Lower Empire is the remote though lineal progenitor of the Gothic style, and through the Gothic, of all the ecclesiastical architecture, properly so called (for we exclude such monstrosities as the Madeleine at Paris) of modern times. Palladio, Michael Angelo, Wren, the greatest of all, whenever they build churches, are Goths in heart. They could not do without Gothic. St. Paul's is a Gothic cathedral in disguise. Vaulting, as observed by Mr. Willis, whose observations we shall now freely adopt, was brought to great perfection by the Romans at the period when, according to the usual conventional phrase, the arts have been said to decline. Compensation is a universal law, both in the intellectual and the physical creation. When taste and elegance, the fine sense of beauty, and the talent for æsthetic decoration waned away, the science of architecture acquired a new dignity and a new power. The art of vaulting, now fully developed, was employed in the vast and complicated structures of the baths, the villas, the piscinas, the amphitheatres, whose ruins linger in Rome, or decorate the magic landscapes of the Bay of Naples, where some of the most remarkable specimens are found. Many difficulties were offered in these structures, when the architect was required to connect and combine the vaulting with the supporting walls; but the hindrance became a stimulant.

The endeavours made by the architects to master these difficulties, brought the art of vaulting to great perfection. Omitting less important examples, or buildings of which we do not possess sufficient details, we are fully enabled to understand the general scheme. Three of the great ruins of Rome will afford us the requisite knowledge of the scheme of construction. The great halls of the baths of Caracalla and Diocletian supply what is wanting to restore the ruins long considered by antiquaries as the *Temple of Peace*,—ruins now clearly ascertained by Bunsen to be the remains of the *Basilica* erected by *Maxentius*, either in the vicinity or upon the site of the magnificent temple raised by Vespasian. If the vaultings of the Thermæ be added to the ruins of the Forum, we shall obtain an accurate idea of the Maxentian Basilica. The vast fragment of the building now standing is known to every one; other portions have been made out by excavations, and by uniting these remains with the analogous halls of the Thermæ, fitting

* See page 253, *ante*.

into the one the details furnished by the other, we shall completely understand the form which the Maxentian Basilica assumed. The nave, for so we will term it, consisted of three huge compartments of Roman vaulting, really resting upon piers, but apparently owing their support to eight magnificent columns, of which several remained till they were removed under the pontificate of Paul V. for the adornment of the church of Santa Maria Maggiore. On either side, the lofty arches opened into as many vaulted apartments, which, resting on one side on the piers of the nave, and on the other on the piers inserted in the wall, formed the side aisles. Windows (in the nature of clerestory windows) were piereed in these lateral walls of the aisles, whilst the inferior height of these collateral portions allowed, or rather required, the insertion of other windows in the walls supporting the arched roof of the nave. The nave terminates in the usual semi-circular apse, but we also find in this Maxentian Basilica another apse, proceeding from the middle division of the side aisle. Bunsen supposes this lateral hemicycle to have been a subsequent addition: and in his plan he meets it, as it were, on the opposite side, by an entrance. Speaking, however, with entire respect for the opinions of so competent a judge, we see no reason for supposing that this second apse was other than an original portion of the building; and if we are to conjecture, we would rather suppose that, as required by symmetry, and as in some degree evidenced by what we shall term derivative buildings, there was an opposite apse, giving to the whole structure somewhat the form of a cross.

This Maxentian Basilica is the only specimen now subsisting at Rome of the vaulted basilica of the lower empire. But the principle of construction which it elucidates, had become incorporated with architectural science.

Whatever may have been the original use of the structure so well known as the *Palais des Thermes*, the halls and chambers presented to the inhabitants of Lutetia the model afforded by the capital. Quitting the Seine we advance towards the Rhine. The same style prevailed in other portions of Belgic Gaul. *One* venerable city yet subsists (we shall soon arrive at it), in which we may behold the walls and arches of the baths, imitating, though humbly, the mansions of luxury provided by Caracalla; and here we trace, united with more recent constructions, the outline of a basilica, combining with the *double apse* of the Ulpian basilica the piers and vaulting of Maxentius. Whether the result of the imagination of another people, or the exertion of an inventive faculty, other buildings in the same locality, though erected under the Roman domination, display forms equally unknown to Rome;—double gateways—portals, rising in successive stages of decoration — projecting towers, whose semicircle offers ranges of arches which may have been suggested by those of the coliseum, but which, in this example, assume a totally different character, from the smallness of their scale.

In describing the basilica of Maxentius, we have, as it were, involuntarily described a Romanesque cathedral. The familiar terms of mediæval architecture convey the most intelligible notions of a construction which the technical nomenclature of the classical age cannot define. Alipius, who enjoyed the patronage of Julian, might have enabled us to describe in architectural phrase the interior arrangement of the Maxentian basilica: Vitruvius gives us no help at all.

Whilst the origin of the *Romanesque* is unquestionably to be sought in the imitation—the degradation, if you choose—of classical architecture, the character this style assumed beyond the Alps, shows a great independence of the Christian basilica of Rome. The Christian architecture of Rome and the Teutonic Romanesque are in the nature of cognate languages derived from the same mother tongue, whose characteristics testify their common origin, but establish their distinctive differences. The roots may be the same, but in each there is a diversity in the inflections, a variety in the construction, a nationality in the phrase."

The writer then proceeds to examine where the mode of building, which afterwards spread over the largest portion of western Christendom, arose.

"In the recollection of the traveller, the scenery of the Rhine and Moselle will always be connected with the venerable ecclesiastical buildings decorating the banks of these rivers, and spreading on either side in the regions once possessed by the prince-prelates of the empire. Abounding with manifest imitations of Roman architecture, and therefore very analogous to those which he may have seen in England or in France, many peculiarities nevertheless shew that they belong to a distinct genus. Tall square bell-towers, consisting of many stories, divided from each other by corbel tables, falling down into semi-circular festoons, and these festoons running down at the angles into flat or slightly projecting pilasters, which panel the walls, afford the first lines which are inserted in the sketch-book. The draftsman will then have to add the round arched windows, usually in couplets, supported by a short central pillar, nearly like what is found in some of the towers now considered to be Anglo-Saxon. Notwithstanding this one similarity, the slenderness of the German Glocken-Thürm, and its many stages, ending in a pyramidical roof, give it a character entirely different from our own structures. The sanctuary, presbytery, or choir, always ends in a portion of a circle or polygon. The exterior of the apse is ornamented by an open gallery; a range of arches, standing upon small columns or shafts, sometimes formed into groups, occurring at symmetrical intervals, or by panellings imitating the gallery. The larger churches exhibit a remarkable peculiarity—a double choir, found in no other part of Christendom; an apse at the east end, an apse at the west end; and not unfrequently the transepts take the same form. Nor are those features confined to the immediate vicinity of the rivers; they extend through the whole of the ancient imperial dioceses—*Cologne, Treves, Worms, Mayence, Spire, Constance;* and if we pass into the imperial territory now annexed to France, we shall find a specimen, and a very remarkable one, as far as *Besançon*.

As the traveller then pursues his journey towards Italy, crossing the Alps by the ancient passes of the Mont Cenis or St. Gothard, the same form still appears, excepting that the double choir is no longer apparent. Trent has her cathedral in this style. It extends over the whole of Lombardy, which includes the modern Piedmont, Parma, Piacenza, and Modena. In Tuscany this *Moselle-Rhenane* style contends with the Roman Basilica. With some slight though distinctive alterations, which will first have become apparent in the St. Gothard's pass, the Glocken-Thürm annexes itself, though as an extraneous adjunct, to the Papal Basilicas. Tuscany displays the style in question, though more rarely. Lastly, it meets with and abandons us at Rome. Unwilling as the ancient capital was to adopt ultramontane taste, the usage of the bell compelled her priesthood to employ the Teutonic structure; and in one example at least, San' Giovanni e Paolo (of which Mr. Knight has given a plate and description, No. xxii.), the sacred structure originally raised by the Roman patrician Pammachius, husband of Paulina, St. Jerome's sister, was replaced by a building of which the design was brought from the colonies of Germany or Belgic Gaul.

Now this general similarity of style was not the result of accident, taste, or fancy. The buildings are, in the strictest sense, *historical illustrations* of the countries to which they belong. They are portions, so to speak, of its *historical costume*. Architecture is the *dress* of man in the aggregate, of human society. If the region in which this Teutonic Romanesque style prevailed be traced out upon the map, it will be seen to agree very nearly with that portion of the empire of Charlemagne which was assigned to Lothar, his grandson."

At Treves the writer finds the *one* example of a Basilica consecrated as a Christian church, in which you see the Corinthian capitals just displaying their foliage. This he considers the model for the structures which, far more than those of Rome, assisted in the development of Christian architecture.

For want of space we abandon the Romanesque for that to which it led:—

"Bunsen adopts a theory similar to that suggested by a reviewer of Mr. Knight's 'Sicilian Antiquities' in a contemporary journal (*Ed. Rev.*, vol lxix. p. 95). Gothic architecture was not the result of an accidental development of art, of obscure masons and labourers of the trowel and mallet advancing and halting in their attempts, until the work started into perfection; but the creation of the genius of some *one* great master, employing the forms and availing himself of the ideas existing in or suggested by the edifices of his age, but who combined them with that power which constitutes originality. He cast the Gothic style at one jet, with all its peculiarities.

In what school was *he* trained? Evidence, we believe, exists, enabling us to conjecture the individuals under whose influence the talent of the *Protogoth* was fostered; but if we can guess at the teachers, we are denied the name of the disciple. Like so many other benefactors of mankind—for *he* was a benefactor who provided for future generations the hallowed glory of the sanctuary—he will probably always remain concealed.

In the continental Gothic, the *main idea* of the Basilica was consistently maintained. Compound shafts became clustered columns; ascending with increasing boldness, the vaulting rose amidst the pointed arches — but the main type continued unchanged. Each region, however, had some peculiarities. *Berne* and *Lausanne* may be compared with Aracœli and St. John Lateran for their plans. Both have the apse, but Lausanne the transept, copied from the Augustan Basilica. Although Rome did not adopt the Teutonic or Gothic style, still she constantly influenced her daughters. But the changes in Liturgical usages naturally affected the buildings in which the rites were to be celebrated. The multiplication of altars necessitated a multiplication of chapels; hence the magnificent plan of Cologne, which exhibits a crown of chapels surrounding the apse of the Roman Basilica. The plan is very remarkable, for Pisa was evidently in the architect's mind. In England, our *Gothic* architects rejected the apse almost unanimously; at least we cannot recollect more than one unequivocal example to the contrary—Westminster Abbey. In other cases, allowing for interpolations, and for the prolongation by the building affectedly (and often erroneously) called the Lady*e* Chapel, the east end of our Gothic churches terminates in a straight line, so that the national form of our choir and presbytery was rectangular. In Italy, the apsidal form prevails in all the Gothic churches; we doubt if more than *one* example can be found of a rectangular termination, and we shall soon see the importance of marking this contrast.

Mr. Knight has made the very important discovery, that Gothic architecture was *introduced into Italy from England*. The English traveller who enters the church of *Sant' Andrea* at Vercelli, will at once be surprised at beholding an edifice repeating the most familiar features of the style, to which the name of *early English* has been applied. The plan of Sant' Andrea is entirely English; pronounced and decided cruciform transepts; a straight-lined rectangular choir; lancet windows, supported by tall detached pillars; simple-foliaged capitals; the plain groined roof. There is somewhat of a foreign accent, if we may use the expression, apparent, if you closely examine the details; yet, in spite of this foreign accent, you might almost suppose yourself at Salisbury.

If the traveller inquires who was the founder of this magnificent structure, he will hear a name which often occurs in the pages of Matthew Paris. It is that of the Legate, Cardinal Wala, or Guala, who appears as an influential statesman in English affairs during the eventful period of the last years of John and the accession of Henry III., when it seemed as if the crown of England might be transferred to a foreign dynasty."

Guala's architect was a French ecclesiastic named Thomas, but there is every reason to believe the working drawings were brought from England. The Duomo at Milan is a transplantation from Germany, with the same prototype as Cologne or Strasburg. Concurrent with the erection of this splendid specimen of the "Gotico Tedesco" in Italy, was the revival of the classic style as commenced by Brunelleschi, and here the writer ends the article from which we have so largely quoted.

Somerset Lunatic Asylum.—In reply to various correspondents we are informed that the selected design for this building is by Messrs. Scott and Moffatt.

ROYAL INSTITUTE OF ARCHITECTS.

At an ordinary meeting of the institute, held on Monday evening last, Mr. J. B. Papworth, V.P., in the chair, Mr. Walker, late president of the Institution of Civil Engineers, who was elected an honorary member a short time since, was admitted.

Mr. Joseph Wilks, to whom the portfolio of the institute is much indebted, presented coloured representations of one of the stained glass windows from the church of Notre Dame des Secours, in the faubourg of Au, at Munich.

Mr. Donaldson, in giving various points of information from France, drew the attention of the meeting to a premium of 50*l.* left by the will of an individual, which is to be adjudged annually to a young architect who unites to ability and knowledge of his profession, the domestic virtues. Mr. Donaldson afterwards read a paper on the architectural and iconographical application of the form of the cross during the middle ages, from the French of Mons. Didron, prefacing it with a statement of his desire to let the members know what was going on abroad. The essay read forms part of a series published by the *Comité Historique des Arts et Monumens* of France, under the startling title of "L'histoire du Dieu," and would satisfy the stanchest admirers of Durandus and symbolism. The use of the form of the cross for the plan of ecclesiastical buildings was traced, and the numerous varieties of it adopted for decoration were explained.

An announcement in the bulletin of one of the French societies, that an English antiquary had applied to them for advice respecting the investigation of Richborough Castle, Kent, led to some comments. Mr. Britton being called up, urged architectural students to lose no opportunity of investigating the antiquities of their country; and to make the study of them the recreation of their leisure hours. He mentioned Burgh Castle, near Yarmouth, as analogous in many points to Richborough Castle; and suggested it as an interesting subject for inquiry. Mr. Scoles remarked that they must make haste if they wished to investigate it; he had just now returned from that part of the country, and had learnt that those remains were in the schedule of a railway bill, and would probably soon be destroyed.

NEW MATERIAL FOR FLOORING, PAVING, AND ROOFING.

The new material or compound, which forms the subject of a patent taken out by Mr. Cassell, of Millwall, consists of many varieties, but possessing all these common properties—that they are perfectly impervious, very elastic, and (there is reason to believe) exceedingly durable.

When intended to be employed for *paving* or *flooring*, or other like purposes, it is composed of four varieties, which, for the sake of distinction, are designated as compounds No. 1, No. 2, No. 3, and No. 4, and are thus described:—

I prepare No. 1 compound in manner following:—I saturate a quantity of chalk, or marl, or lime, or loamy clay, or sandy earth, previously reduced to the state of a fine powder, with oil of tar, or mineral tar, or vegetable naphtha, or any other resinous, oily, or fatty matter. I take one cwt. of rosin, and melt it in a caldron exposed to a gentle fire, until all the water in it has evaporated. I then throw into the caldron two cwt. of the saturated chalk or other earth, and mix it well with the melted rosin. I next add from 3 to 6 lbs. of liquid caoutchouc, or from 1 to 3 lbs. of essential oil of tar, or turpentine, or some other oily, or fatty, or cementitious substance (varying the quantity according to the degree of elasticity desired to be given to the ultimate compound), and after that, from 3 to 5 lbs. of sulphur; and finally, two cwt. of fine dry grit, keeping all the while the contents of the caldron well stirred, till the whole are thoroughly amalgamated. When cool, this compound is of a slatish grey colour, and of a close granular texture. No. 2 compound is prepared in the same way as No. 1, and composed of the same materials, and in like proportions, excepting only that I substitute for the rosin, vegetable pitch, and use a larger proportion of sulphur, say from 6 to 8 lbs. No. 3 is also prepared in the same way as Nos. 1 and 2, and composed of the same materials in the like proportions, excepting that instead of the rosin or vegetable pitch, I use equal parts of rosin and Stockton tar, and reduce the quantity of sulphur to about 4 lbs. No. 4 compound differs from No. 3 in the substitution of equal parts of rosin and mineral, or coal tar, for the equal parts of rosin and vegetable pitch.

These compounds may be used by themselves—"being laid down in a hot and fluent state, and of sufficient thickness;" or they may be employed in any of the following states of combination:—

Firstly, they may be combined with any of the natural asphaltes or bitumens, or any artificial compound of a bituminous quality.

Secondly, they may be formed, in combination with small pieces of wood, into large blocks for use.

Thirdly. Any of the compounds before described may be used in combination with wood, in manner following, to form a flooring for the ground floors of buildings, which will be quite impermeable to under damp, and exceedingly durable. The ground is to be first covered over, to the depth of about an inch, with a layer of any of the four compounds before mentioned (being previously well beaten down and levelled), and then small square blocks of wood of equal sizes are to be set in this composition while yet warm, with the grain uppermost, and placed in regular order, side by side. Any interstices which may be left between the blocks are to be carefully filled up with the compound. Or, instead of using small blocks of solid wood, composition blocks of a large size, prepared as follows, may be employed:—I take a number of pieces of deal, from 3 to 5 inches wide, and from 10 to 18 inches long, such as may be picked out of the woods imported from abroad under the denomination of fire-wood, and which, paying a small duty, may be had cheap, and lay them in an iron frame or mould, in the direction of the grain, jointing them roughly together lengthwise, but so that they shall break joint transversely. I then cover them to the depth of one or more inches with any of the four compounds before described, in a hot fluent state, and leave this coating to settle and cool, whereby it becomes firmly united to the wood beneath. On removing this mass or block from the frame or mould, and fitting it into a piece of flooring, it is placed with the wood uppermost, which remains ever after beyond the reach of damp from beneath. For such a description of ground flooring no joists are requisite. The blocks may be made of any length or breadth most convenient; but I prefer making them of about 4 feet in length, by 2 feet 6 inches in breadth. When a very strong flooring of this kind is wanted, I cross the layer of wooden pieces before described with a second of exactly the same description, but laid the reverse way, and upon an interposed bed of one or other of the four compounds before mentioned. The two layers are then pressed together; and when the compound which unites them has cooled and set, I pour over the whole another coating of the same compound, so as to cover completely the second layer of wood. Instead of the blocks being all of one sort of wood, or of one colour, they may be of different woods and different colours, so as to give the flooring a tesselated appearance.

Of the suitableness of the material for road paving there have been as yet but slender opportunities of judging. In Kensington Palace Gardens there is a small specimen to be seen; and another in Camphine-road, Millwall, Poplar. It is laid down in blocks of about the dimensions of York paving stones, and is pleasant to walk on.

For *roofing*, and other purposes where lightness is desirable, Mr. Cassell makes use of a compound different from any of the others, which is called "No. 5 compound," and thus described:—

It consists of a mixture of 1 cwt. of rosin or vegetable pitch, or 1 cwt. of rosin and vegetable pitch in equal proportions, or 1 cwt. of rosin and Stockton tar in equal proportions, or of 1 cwt. of rosin and mineral tar in equal proportions, 1 cwt. of fine grit, 8 lbs. of sulphur, and from 4 to 5 lbs. of cork cuttings or raspings, the whole being compounded in the manner before directed, to be followed in the preparation of the other cements, and thoroughly incorporated together. While yet hot, this compound is removed from the caldron and formed into sheets, by subjecting it to strong hydraulic pressure between plates of iron perforated with numerous holes, and having also channels or grooves in them, in order that any liquid matter squeezed out by the pressure may run over at the sides and ends. The sheets, when intended for roofing, should be reduced by the pressure applied to about one-fourth of their original bulk, say from 4 inches to 1, and should be coated with some anti-igniting substance or composition. Where greater strength is required, each sheet may be covered with canvas or paper cemented to it, by any of the compounds, 1, 2, 3, or 4.

The specification of the patentee explains also how the material, in one or other of its several varieties, may be applied to the formation of pipes, casks, tanks, cisterns, garners, railway sleepers, &c.

ARCHITECTURAL MEMS. FROM THE COUNTRY.

The Manchester Exchange-room is about to undergo very considerable alterations. The present room contains about 699 square yards, and, when completed as proposed, will possess an area of 1,414 square yards. A portico fronting Bank-street is to be erected, to consist of a lofty colonnade of eight pillars, supporting a massive pediment. The design is by Mr. A. W. Mills.——The Trinity House board have determined upon erecting a lighthouse at Trevose head, in the parish of Padstow, Cornwall. A road is already being prepared for the conveyance of materials to the spot.——A subscription for erecting a church for the Tewkesbury-road district, in Cheltenham, has reached the sum of 1,500*l.* An additional 500*l.* is required to carry out the work.——The small old chapel at Birch, in the township of Rusholme, near Manchester, having been found inadequate to the accommodation of the growing community in that district, the proprietor of the estate, J. W. H. Anson, Esq., in conjunction with his brother, the Rev. George Anson, has determined on building a good church in its stead, towards which Mr. Anson has given 200*l.* and the land, and also land for a churchyard, and the Rev. G. Anson has contributed the munificent sum of 2,000*l.* In aid of these sums a grant of 500*l.* has been made by the Manchester and Eccles Church Building Society. The site selected for the church is about twenty yards to the east of the present chapel. The church will be in the early English style of architecture,—that which prevailed about the middle of the 13th century. ——At Bury St. Edmund's, the spirit of improvement has suggested to the inhabitants the restoration of their fine old Norman tower. A committee has been formed for the purposes of obtaining from Mr. Cottingham plans and specifications for the necessary works, and of inviting builders to make tenders for carrying the same into effect.——Three new churches are about to be erected at Birkenhead; one at the sole expense of William Potter, Esq., to be dedicated to St. John the Baptist; the second at the sole expense of William Jackson, Esq., to be dedicated to St. Andrew, and the third at the joint expense of Messrs. W. Potter, W. Jackson, John Laird, Macgregor Laird, and W. Laird. The site selected for the last-mentioned church is on the corporation road, in the vicinity of Wallasey-pool.——Considerable improvements have recently been effected by the removal of an accumulation of earth from the basement of the north and south sides of Peterborough cathedral. This had been for some time a growing eyesore to the admirers of the architectural beauties of this venerable pile. The fine Norman door is now seen, as no doubt it was originally intended, but which has for some time been in a great measure hid by this earth.——On Wednesday, the 21st inst., the opening took place of the Victoria schools erected at Chesterfield in commemoration of the Queen's passing through that town on her way to the seat of the Duke of Devonshire, at Chatsworth. The building is in the Elizabethan style, and capable of accommodating about 600 children. —— At Bridlington, in Yorkshire, efforts are being made by the directors of the Mechanics' Institute to raise a sum sufficient for the erection of a lecture

room, &c.; 200*l.* have been already subscribed, and there is no doubt but the sum will be considerably augmented. —— At Melpash Green (midway between Beaminster and Bridport) the foundation stone of a new church was laid last Thursday week by the Hon. and Rev. Somerville Hay. It is to be 109 feet long, 60 feet wide, and to have a steeple 60 feet high, with five bells therein. It is estimated to hold 400 persons. Mr. B. Ferrey, of London, is the architect.——It is in contemplation to make the village of Hunstanton, in Norfolk, a very attractive and convenient place for seaside visitors, by appropriating some portion of its celebrated cliff and the fields adjoining to the formation of a village, with an hotel, bath-house, library, shops, and other buildings necessary for the establishment of a sea-bathing place. In the arrangements of the plan a site for a chapel is to be reserved, and a pleasant walk formed to the chalybeate spring, which is within a mile of the village. —— The committee for the formation of public parks and play-grounds in Manchester have purchased Endham Hall estate, at Harpurhey, the residence of Mr. Jonathan Andrews, for a sum of 7,250*l.* A few weeks ago they purchased the Lark Hall estate, in Salford, from Mr. Wm. Garnett, for 7,000*l.*; and we believe these two properties will be laid out as parks, and ready for occupation in the course of a few months. —— His Grace the Duke of Cleveland has given 100*l.* to the schools about to be attached to the collegiate church, Wolverhampton, and become a subscriber of 20*l.* per annum. —— A meeting of the committee for promoting the establishment of public baths and places of recreation at Birmingham, was held on Tuesday week, when it was resolved that steps should be immediately taken for the erection of two sets of baths.——The restoration of St. Mary de Crypt Church, Gloucester, is to commence forthwith, the sum of 1,450*l.* having already been subscribed.——The Bishop of Durham has contributed 500*l.*, and the Rev. George Fielding, the incumbent, 100*l.*, towards the enlargement of St. George's Chapel, Bishop Auckland.——The Collegiate School at Marlborough increases so rapidly in favour with the public, that it is found necessary to make very extensive additions to the buildings, without delay. The suite of rooms appropriated to the accommodation of the head master has been made ready for the reception of additional pupils; and amongst the additions now contemplated, a suitable residence for that functionary will be erected. The number of pupils at present in the establishment is upwards of 200, and the applications for admission are very numerous.——Dr. Warneford, who has already expended 7,000*l.* in the erection of charitable institutions in Birmingham, is now making arrangements for laying the foundation for a House of Recovery for persons afflicted with contagious diseases. Earl Howe has also subscribed 50*l.* for the same object.—The Rev. Dr. Warneford has just paid over to the Rev. Chancellor Law, the Rev. Vaughan Thomas, and William Sands Cox, Esq., his munificent donation of 500*l.* towards the additional building at the Queen's Hospital.—— At a preliminary meeting held at Dee's hotel, Birmingham, last week, it was resolved to establish a public cemetery, for the town and neighbourhood, in connection with the Established Church. The proposal has received the sanction of the Bishop of the diocese, and the principal church authorities of the town. ——The old houses at the west end of St. Peter's Church, Sudbury, are now levelled to the ground, this labour of many years having been completed last week, when that fine ecclesiastical edifice, so long encumbered by the encroachments of a tasteless age, was once more displayed in all its fair proportions. The church now stands entirely clear of all obstructions in the middle of the area; but the removal of these obstructions has disclosed the barbarous manner in which parts of the windows have been blocked up, and the ornamental work has been defaced; and a large sum will be necessary for its complete restoration.——A company has been formed for the purpose of erecting a landing-pier and slip, at Weston-super-mare, in the Bristol Channel. The pier is to be of solid masonry, commencing from the junction of the Knightstone-road, continuing in a north-west direction to the Isle of Bearnbeck, passing over the island and extending into the channel to dead low water, the whole length being little short of a mile, and of the width of 30 feet throughout. The approach from the channel will be at all times at a depth of water sufficient to insure the safe landing of passengers, being at lowest point not less than 18 feet, and will give a safe, speedy, and cheap mode of communication to parties visiting or trading to the western, Welch, and Irish coasts. It will be so constructed as to afford a delightful promenade to visitors and inhabitants. The engineer is Mr. Daniel Horwood, of Bristol.

THE IRON TRADE.

The reduction of 2*l.* per ton in merchant-iron, announced in our impression of this day fortnight, has been general throughout the South Staffordshire district. The present price is probably not higher than can be steadily maintained until some of the heavy orders for rails are cleared off. The speculation in pig-iron in Liverpool received a very serious check during the past week. Many of the needy holders have pressed sales, and large parcels of Scotch pigs have been offered at 75*s.* per ton. Early in March, purchases were made at 110*s.*, and none of the makers would take orders under 120*s.*

The feverish state of the present year's market is expected to occasion the iron trade a permanent injury, from the fact that the Americans are now strenuously endeavouring to produce more iron. The produce of iron last year in the States amounted to 500,000 tons; the estimate for the present year is much larger; and in ten years it is calculated that the make will reach a million of tons, unless the fall in prices in Great Britain should be such as to render it cheaper for the Americans to purchase our produce than to manufacture for themselves.

A correspondent of the *Glasgow Herald*, who we are given to understand has good means of obtaining accurate information as to the present and future prospects of the iron trade of Scotland, says that the quantity of pig-iron made at present in Scotland will amount annually to from 400,000 to 420,000 tons. Of this quantity about 100,000 tons are used for the manufacture of malleable iron in Scotland; of the remaining 320,000 tons, 50,000 tons, or thereabouts, turn out to be what is called white or forge pig, which is not used for making castings, so that the present annual production of pig-iron in Scotland, suitable for foundry purposes, is 270,000 tons. There are ten new furnaces in the course of erection, some of which may be in blast this year. These furnaces belong to the present manufacturers of iron, and, when all in operation, will add about one-eighth to the present production; but, as the manufacture of maleable iron is on the increase in Scotland, a large additional supply of pig-iron will be required for this purpose. It is obvious, therefore, that the statements which have recently appeared, as to the increase in the make of pig-iron in Scotland, are incorrect; and it must be kept in view that, while the present makers are erecting new works, the produce of the older ones must decrease, in consequence of the exhaustion of the mineral fields on which they depend for the supply of materials.

To Cure the Diseases which arise from the Use of Lead in certain Trades. — Take two baths of soap and water every week, occasionally adding a little sulphur, and carefully wash the uncovered parts of the body with soap and water at every interval between your working hours. You must drink one or two glasses of lemonade, made with sulphuric acid, every day, according to the greater or lesser quantity of dust or poisonous vapour with which the surrounding atmosphere may be charged. At the same time you should be more careful than the followers of any other trade, to abstain from the use of spirituous liquors. The efficacy of this preventive treatment is easily explained by the fact, that the mineral poison absorbed is thus converted into a soluble, and therefore innoxious salt (sulphate of lead), and the saturnine particles deposited on the surface of the body are taken away.

BRITISH ASSOCIATION FOR ADVANCEMENT OF SCIENCE.

There seems every reason for believing that the approaching meeting, to be held in Cambridge next month, will be brilliant and successful. A local subscription has been commenced with good spirit to defray the expense of the requisite preparations for receiving the association, and all the necessary arrangements are in progress. The attendance of distinguished foreigners is expected to be great. A programme has been issued to members, from which we learn that the general committee will meet on Wednesday, the 18th of June, at one o'clock, for the election of sectional officers, &c. From Thursday, the 19th, to Wednesday, the 25th of June, inclusive, the committees of sections will meet daily at ten precisely; and the sections will meet from Thursday to Tuesday at eleven precisely. General evening meetings will be held on Thursday, the 19th, and Wednesday, the 25th, at eight o'clock. A room will be provided for the reception of philosophical apparatus, and specimens of natural and artificial products, which may be brought for the purpose of illustrating particular communications, or for exhibition to the members generally. We would remind the public of what the Dean of Ely stated in the Town-hall, namely, that persons may be admitted to the sectional meetings *only*, on being nominated in writing by a member, and paying 1*l.*, and that ladies' tickets may be had, through the application of a member, on payment of the same sum. Strangers need be under no sort of apprehension on the subject of lodgings: accommodation will be secured for them by the committee at a perfectly reasonable rate.

One of the local papers says, "Extraordinary as the statement may appear, we claim credit for entire accuracy when we state that the Town-hall of Cambridge is undergoing a process of cleaning and smartening-up. The presenting of such a miserably shabby old place to the members of the British Association would have been a disgrace which Cambridge, we are glad to say, is now likely to escape. The plasterers, carpenters, and painters are hard at work, uniting their efforts to make the place presentable, and in a week or two its most intimate friends will scarcely recognize it."

Correspondence.

BRICK AMATEURSHIP.

"Quot Homines, tot sententiæ."

Sir, — Your correspondent, "Mr. John Phillips," is a thorough English amateur of *brickwork*, with all its "reticulated or decussated pieces of work, with interstices between the intersections," as Dr. Johnson has said on another occasion: but lest all the world in such case should be thought to let judgment go by default, because they do not offer any opposing opinion, I beg to say, as one of the architectural and fine-arts-loving public, that to *my* eyes nothing more outrages good taste and deforms English towns and English landscapes than these structures of brick-building amateurs, whose deformities in *blazing red, dirty yellow*, or *plastery white*, destroy the picturesque in city, town, or country; and though I do not rejoice in *unsound walls*, yet I think it quite compatible *with* sound work to employ stucco, where marble or stone is precluded from necessary views of economy; and I hope and trust the day is fast arriving when people will only let brick walls be seen where they can afford to have nothing better.

Hoping to find more "sympathisers" on *my* side of the question than that of your worthy correspondent "Mr. John Phillips,"

I am, Sir, &c.,

W. Mason.

CEMENT ON IRON.

Sir,—I shall feel greatly obliged to any of your correspondents who will inform me of the best cement I can use for running mouldings on iron girders; I am afraid to use plaster of Paris for fear of corrosion.

I am, Sir, &c.,

Worcester. Subscriber.

Miscellanea.

MOVEMENT IN SOCIETY OF ANTIQUARIES.—At a meeting held on the 22nd inst., Dr. Bromel, in order to induce stricter attention to the business of the society than has latterly been given, handed in a draft for a new statute, enacting that the council shall meet at a certain hour of one fixed day of every month (the first Tuesday for example), and that it shall not separate except by a vote of two-thirds of the members present. We are glad to find that the remarks which appeared in our last and a former number, have been received with the same kind feeling with which they were written. All agree that something must be done to meet the times and prevent disruption. One of the first steps should be to make the library useful to the members, and facilitate access to it. At present it is very nearly useless.

CHURCH DECORATIONS.—The Bishop of Norwich, in his charge delivered lately at Woodbridge, says, with regard to this subject, that—"He admired the motive of those who sought to repair the ruined and dilapidated condition of those venerable places of worship, many of which were utterly unfit for the sacred purposes to which they were devoted. In this, the advocates of a less-enlightened religion had displayed a zeal which those who boasted of a purer faith might have done well to avoid. He could not exactly comprehend the arguments of those who could oppose the development of their acquirements to their fullest extent in the service of Him from whom they derived their talents. On that ground he would encourage the taste for decorations, whether external or internal. Who could behold without gratification the finest specimens of art, whether architectural or pictorial, or regard without pleasure the productions of the painter or the sculptor, and not feel that religion had patronised these sister arts? There was, he admitted, an antiquated objection to such decorations, because they had formerly been the objects of superstitious worship. In a previous age, when men's minds were under the control of superstition, when they were enslaved by the priesthood, such an argument might have had some weight; but in the present more enlightened era there was little foundation for such apprehensions. The friends of the Protestant church might now look without danger upon what had been once dangerous, and they should have no sympathy with the spirit which went forth as the destroyer of all that was beautiful.

WELSH LEAD MINES.—English manufacturers derive great benefit from the Welsh mines; it is from the purity of the galena of lead ore, purer in Wales than any other, that the Staffordshire pottery has maintained its superiority in foreign markets, as it produces a finer glazing, and makes a more beautiful porcelain than any other. Wales is rich in fossiliferous marble,— the carbonate shell marble of South Wales, and the encrinitic of North Wales: the serpentine of the Rhos Kolin is equal to the verd antique of Genoa. It is not generally known that schools of metallurgic chemistry existed in Wales before the wars of Edward the Third: the college of Pherillt, in Dinaraon, on Mount Snowden, was celebrated for a school of this order that gave the British name of Celvydda Pherill to these arts; they were in possession of eminent books on these sciences, now lost. Another school of this order was founded in South Wales—a branch from Dinas Emrys.—*Chester Chronicle.*

BAZAAR AT COVENT GARDEN.—The free trade bazaar having closed, the directors invited a large body of their friends to a musical promenade on Wednesday evening last, and provided them profusely with amusement and refreshments. We should not consider it our province to speak of the occurrence (admirably managed as it was), but that it gives us the opportunity of directing attention to the beautiful specimens of cast-iron from Colebrook Dale, which were exhibited and which equalled many French bronzes sold at three times the price. The Art-Union of London, who have materially assisted to advance the production of bronzes in this country, and are now about to aid the porcelain manufacture, would do well to turn their attention to these castings in iron, and to give those who have produced them, a commission for the purposes of the society.

NEW PAVEMENT.—The surveyors of Manchester have recently laid down, in Hanging Ditch, a novel kind of pavement, or rather a combination of macadamised stone, profusely intermixed with asphaltum. A local paper states, that from the time it occupied in its formation—twelve days and nights— it ought to be a really durable job: whether it will prove so, time alone can tell; but the expense has, no doubt, been much greater than the ordinary pavement would have been. The street has already attained great firmness and solidity.

Tenders.

TENDERS for finishing 12 third-rate Houses at Sherbourne-street, Hoxton, under Messrs. W. Waller and Son, Architects.

Turner	£3,365
Trego	3,230
Jay	3,197
Lawrence	3,118
Haines	3,079
Ashby	2,998
Wilson	2,932

Tenders delivered for sundry repairs to the new Gravel-pit chapel, at Hackney, Mr. R. W. Wright, surveyor.

Weston	£256 10
Shewin	224 5
Norris	197 0
Burford	185 0
Lloyd and Parker	170 0
Heath	153 5

NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the erection of the Borough Gaol, Birmingham.

For the performance of the necessary works in the construction of a New Dock in the Borough of Kingston-upon-Hull.

For a quantity of *proof chain* 2¼, 1¼, 1, ¾, and ½ inch, wanted by the Universal Salvage Company.

For Building the Carcasses of certain first-rate Houses, with Shop Fronts, in the new line of Oxford-street, leading into Holborn.

For executing Works on the Leeds, Dewsbury, and Manchester Railway, being a distance of about 4¼ miles. The principal work on this division is the summit Tunnel, near Morley, which is upwards of 3,000 yards in length.

For supplying the trustees for repairing Grosvenor-place, and the squares and streets adjacent, with the best Pit Flints, Kentish Rag-stone, Pit Gravel, Chalk, Aberdeen Granite Kerb, York Paving and Guernsey Granite, &c.

For building Two National School Rooms, at Saffron Walden, Essex.

For the erection of Schools, and a Master's House, and also a new Farm-house and Offices, on the Estate of the Rev. E. K. Benyon, near Bury St. Edmunds, Suffolk.

For constructing about 450 feet of new Wharf, along the River-side, in the Town of Wisbeach, and for erecting a new Crane and Warehouse for the Corporation of Wisbeach.

For the erection of Farming Premises, at Bradfield Combust, near Bury St. Edmunds.

For supplying, laying down, and bedding, in proper Mortar, any quantity that may be required, not being less than 1,000 feet run of Aberdeen Kerb, 12 inches by 8, and not less than 7,000 feet (super.) of York Paving, two and a half inches thick, for the Commissioners of the Kentish Town District.

For supplying the Commissioners of Kentish Town District with Materials for Road-making.

For the Repairs to the South Aisle, Roof, &c., of St. James's Church, Bury St. Edmunds.

For Building a Sewer in the King's Road, St. Pancras, of the dimensions of 4 feet 6 inches by 2 feet 9 inches, for a length of 250 feet.

For the supplying of certain Mines in Cornwall, for twelve months from Midsummer next, with Norway Timber, half Dram and half Longsund, of good quality and average length. The probable quantity required is 710 loads.

For Lime-washing and Plastering (when required) twice in the year, the interior of the Union Workhouse, Long Ashton.

COMPETITIONS.

Plans, sections, and elevations for a Terminus, and other requisite accompanying offices, for the Great Southern and Western Railway, Ireland.

A premium of 30 guineas will be presented to the party offering the best plan of Docks, capable of admitting ships of 1,000 tons burden, to be erected at Burnham, in the Bristol Channel.

Designs for houses to be erected at Dover. The ground is nearly seven acres in extent, and lies on a gentle slope between the south-west boundary of Dover Castle and the town. A premium of fifty guineas is offered for the set that may be most approved of.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

The timber and other trees now standing upon the estate at Woodseaves, Salop. By order of the Lord Chancellor made in the cause "Dickin v. Barker."

At Eversden Wood, Cambridge: 80 Oak Timber Trees, clean, sound, and of useful dimensions.

At Bourn, Cambridge: a capital Fall of prime Oak Timber, comprising about 100 Trees of good dimensions.

At Monk Sherborne Brick Kiln, Basingstoke, Hants: upwards of 200,000 new Building Bricks, 40,000 Arch ditto, 25,000 Tiles, &c.

At Brandon, near Coventry: several Thousand prime Oak Trees, and a quantity of Planks and Quarterings.

At Winston, near Debenham, Essex: 400 feet 1½-inch Elm Plank, 400 feet 1½-inch Ash ditto, 800 feet 2 inch, 2½-inch, 3½-inch, and 4-inch ditto, 21 4-inch Beech Planks, 180 feet Sycamore Quarters, &c.

At Eversden Wood, Cambridge: 110 capital clean Oak Timber Trees; all lying close to good roads, and are very long, straight, and clear.

At Bourne, Cambridge: 63 Oak Timber Trees; many of them are of very excellent quality, of great length, and particularly clean and straight.

At Waybridge Wood, near Ellington: a considerable fall of Oak Timber in Honey Hill and Lower Woods: the whole being of large dimensions and excellent quality.

At Halstead, Essex: a quantity of capital Oak Timber, &c., in Great Spansey's Wood, near Halstead.

At Richardson's Wharf, Limehouse: a large quantity of superior dry and sound stock of Dantzic Yellow and Red Pine, Ash, Swedish and Memel Timber; about 10,000 White Spruce and Yellow Battens, &c.

In the Old Deer-Park, Kew: between 300 and 400 Lime, Elm, Oak, Chestnut, Beech, Larch, and other Trees, some of large dimensions, from the Royal Gardens and Plantations at Kew.

At Steeple Bumpstead, Essex: 100 Oak Timber Trees of large dimensions, clear and straight, now lying upon several farms in the neighbourhood.

BY TENDER.

A Virgin Forest of Valuable Timber in Walachia. The principal part of the Trees is Oak. The said Forest may produce about 500,000 cubic feet of Timber.

At Little Bentley Hall, Essex: several Acres of Plantations, consisting of superior Firs, Larch, Spruce, &c., to be taken down by the Purchaser.

TO CORRESPONDENTS.

"F. T. D."—*Accepted with thanks. Will our correspondent prefer that his name, or initials, should appear.*

"Ashstick and hide 'em."—*Funny, but useless.*

"H. Johnstone."

"John Kelly."—*The sketch sent has hardly sufficient character to induce us to engrave it, but we shall be very happy to receive the promised article. The round towers of Ireland have much interest.*

"A. B." *may obtain the information he seeks at the rooms of the institution, 25, Great George-street, Westminster.*

"J. F. B."—*We know no better "glossary of terms used [by architects" than that in Gwilt's "Encyclopædia of Architecture."*

"W. P. G."—*What our correspondent refers to was but a suggestion; if it should become a probability, he shall hear from us.*

"Society of Antiquaries."—*Correspondents on this subject will find, on consideration, that violent attacks are at present uncalled for, and would be unwise.*

"X. Y. Z."—*The object of "J. F.'s" letter was not to question "Mr. Thompson's" accuracy, but to learn if any hagioscopes of the Norman period were known.*

"Roof covering in America."—*In reply to an inquiry for a good and light material for this purpose, "J. B." recommends Morewood's patent galvanized tin.*

"G. Collier."—*One air-tight tin box, of the size and weight stated, would float about 400lbs.*

"Archi." *next week.*

Received — "The Commonweal," No. 1.—"J. E. G." (Hackney).

MEETINGS OF SCIENTIFIC BODIES

During the ensuing week.

MONDAY, June 2.—*Entomological*, 17, Old Bond-street, 8 P.M.; *United Service Institution*, Whitehall Yard, 9 P.M.

TUESDAY, 3.—*Linnæan*, Soho-square, 8 P.M.; *Horticultural*, 21, Regent-street, 3 P.M.; *Civil Engineers*, 25, Great George-street, 8 P.M.

WEDNESDAY, 4.—*Society of Arts*, Adelphi, 8 P.M.

THURSDAY, 5. — *Royal*, Somerset-house, 8½ P.M.; *Antiquaries*, Somerset-house, 8 P.M.; *Zoological*, Hanover-Square, 3 P.M.

FRIDAY, 6. — *Royal Institution*, Albemarle-street, 8½ P.M.; *Botanical*, 20, Bedford-street, Covent Garden, 8 P.M.

SATURDAY, 7. — *Asiatic*, 14, Grafton-street, 2 P.M.

ADVERTISEMENTS.

ROYAL POLYTECHNIC INSTITUTION.—The ATMOSPHERIC RAILWAY exhibited by a Working Model, having a power to carry visitors. A CURIOUS MECHANICAL HAND on a person who has lost his natural hand. Dr. RYAN'S LECTURES on the CHEMISTRY of DOMESTIC LIFE daily, at a quarter past Three, and on Wednesday and Friday evenings at a quarter to Nine. Professor BACHHOFFNER'S varied LECTURES with brilliant Experiments. Lectures on Character, with Musical Illustrations, by Mr. J. Russell, accompanied by Dr. Wallis on the Piano-forte, on the evenings of Monday, Tuesday, and Thursday, at Eight o'clock. New and beautiful objects in the CHROMATROPE, PHYSIOSCOPE, PROTEOSCOPE, &c. NEW DISSOLVING VIEWS. SUBMARINE EXPERIMENTS by the DIVER and DIVING BELL. Working Models described daily.

Admission, 1s.; Schools, half-price.

WHITE KNIGHTS' PARK.

THE BOTANIC GARDENS and WILDERNESS of this celebrated Domain will be OPEN for the admission of the Public, during the Summer season, on MONDAYS and THURSDAYS. Tickets of Admission, ONE SHILLING each person, and Family Tickets, to admit eight, FIVE SHILLINGS, may be obtained of Messrs. Scott and Moffatt, Architects, 29, Spring Gardens; of Mr. Frederick Chinnock, Estate Agency Office, 28, Regent-street; at the Offices of "The Builder," No. 2, York-street, Covent-garden, and "The Gardener's Gazette;" of Messrs. Richards and Rogers, Solicitors, 10, Friar-street, Reading; and at Mr. Welch's, "Berks Chronicle" Office, 12, Market-place, Reading.—Day Tickets to Reading are issued by the Great Western Railway.

PATENT HANDRAILS. — J. MELVILLE, after upwards of Twenty Years' experience in the Manufacture of the above, can now, with confidence, recommend them to Architects and Builders, combining Beauty and Durability; avoiding heading joints, and the grain of the wood continued throughout the wreathed, or otherwise circular parts. They are now patronised by the most eminent Architects, to whom reference can be given.—Specimens and prices sent to Architects or Builders, in Town or Country. Columns Veneered, Pew Capping, &c.—No. 64, John-street, Fitzroy-square, London.

DUTY OFF ORNAMENTAL WINDOW GLASS.

CHARLES LONG begs to inform his Friends and the Public, that he can now supply Ornamental Glass from 1s. 3d. per foot superficial; and borders from 9d. per foot, run; and having just built two of the largest Kilns in London, is enabled to execute extensive Orders with unprecedented dispatch, 1, King-street, Portman-square.—Terms, Cash only.

DUTY off WINDOW GLASS. — On April the 6th, Squares stouter and of better make than formerly for Glazing purposes at 6d. per foot.

NURSERYMEN, MARKET GARDENERS, AND OTHERS requiring Small Glass, will find a greater variety of sizes (a large Stock of which is constantly on hand) than is kept by any other house in London, from 4d. per foot. Flattened Sheet, Stained, Fluted, the BIRMINGHAM Sheet Plate (superior in all respects to every other make), and Ornamental Glass of every description. Complete Lists of Glass, Lead, Colours, &c., at ready-money prices, may be had (gratis) on application to R. Cogan, at the Western Glass, Lead, and Colour Warehouse, 5, Princes-street, Leicester-square, London.

SURVEYORS, CONTRACTORS FOR PUBLIC WORKS, and the TRADE generally, sending specifications of quantities required, will receive by return of post an invoice at the very lowest cash prices.

A parcel of very Superior Spruce Oker, suitable for PLASTERERS AND PAINTERS, to be sold at 6s. per cwt.

MARTIN'S PATENT CEMENT.

TO ARCHITECTS, BUILDERS, AND PAINTERS IN FRESCO.

STEVENS and SON, PATENTEES and SOLE MANUFACTURERS, beg respectfully to announce that this beautiful cement has now arrived at a degree of excellence far surpassing their most sanguine expectations. For all internal work it possesses a great superiority over every article hitherto in use; it is now being used extensively by Government in the British Museum and other public buildings. IT DOES NOT THROW OUT ANY SALT, but presents a beautifully plain and perfect surface, which may be painted upon dry work within four days without peeling. It is equally applicable for walls or lath, for mouldings, architraves, skirting, or flooring; and is admitted to form the best ground for fresco painting, having been used for many of the prize frescos lately exhibiting in Westminster Hall. It will bear an intense heat without cracking, and for hardness, durability, and economy, cannot be equalled.

198, DRURY-LANE, LONDON.

Agent for Liverpool and Manchester, Mr. R. Part, 11, Atherton's-buildings, Dale-street, Liverpool.

ATKINSON'S CEMENT.—The public is respectfully informed, that the price of this very excellent Cement, which has now been in use for Architecture and Engineering works upwards of thirty years, is reduced to 2s. 3d. per bushel, and may be had in any quantity at Wyatt, Parker, and Co.'s Wharf, Holland-street, Surrey side of Blackfriars-bridge.

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